CHEMICAL INDUSTRIES

FORMERLY KNOWN AS "CHEMICAL MARKETS"

VOLUME XXXIII DECEMBER, 1933 NUMBER 6

Contents for December, 1933

CHEMICAL INDUSTRIES *is indexed regularly in the* INDUSTRIAL ARTS INDEX

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Published on the tenth day of each month at Pittsfield, Mass., and printed for the publishers by the Sun Printing Company.

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WE DO OUR PART

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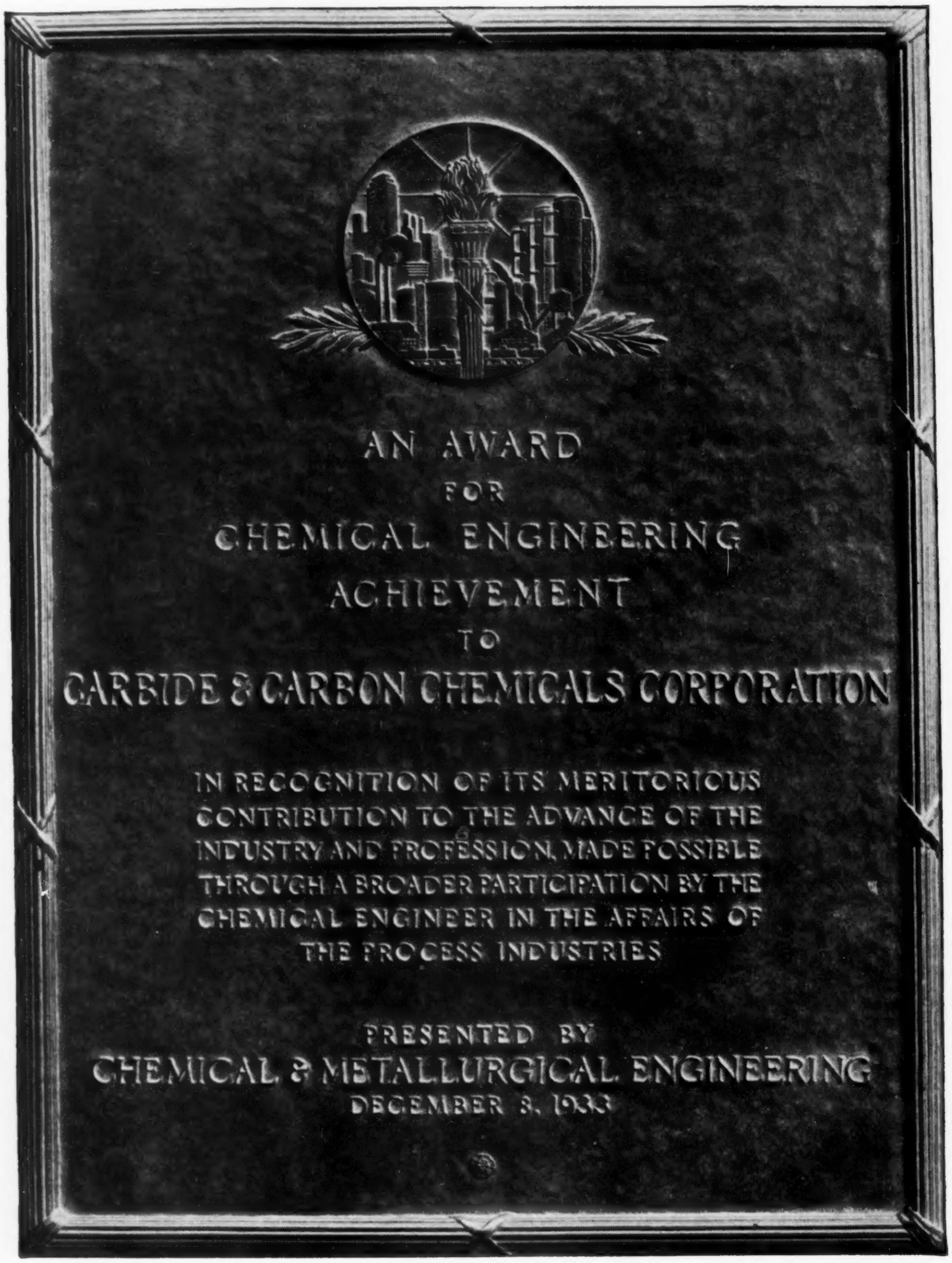
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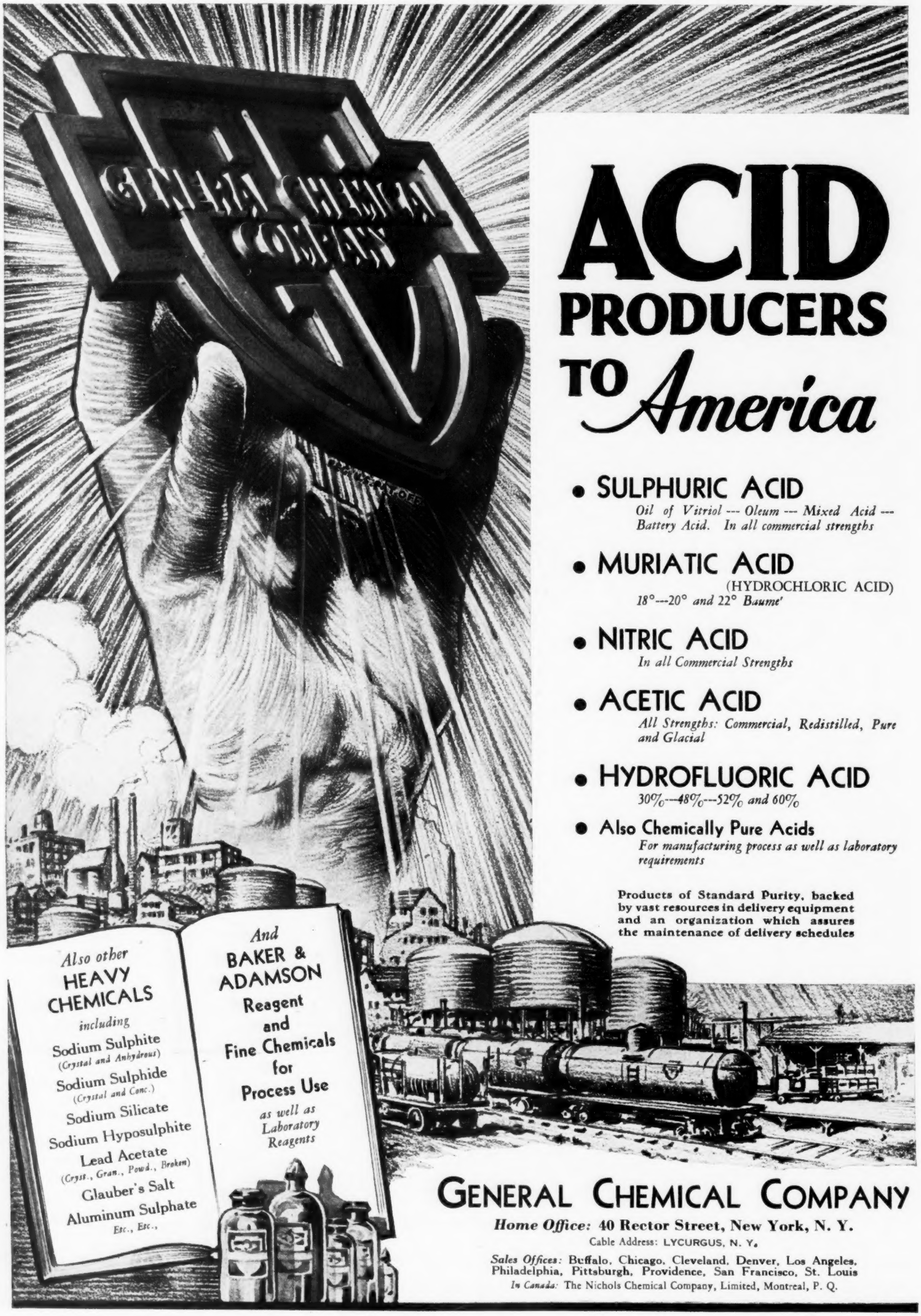
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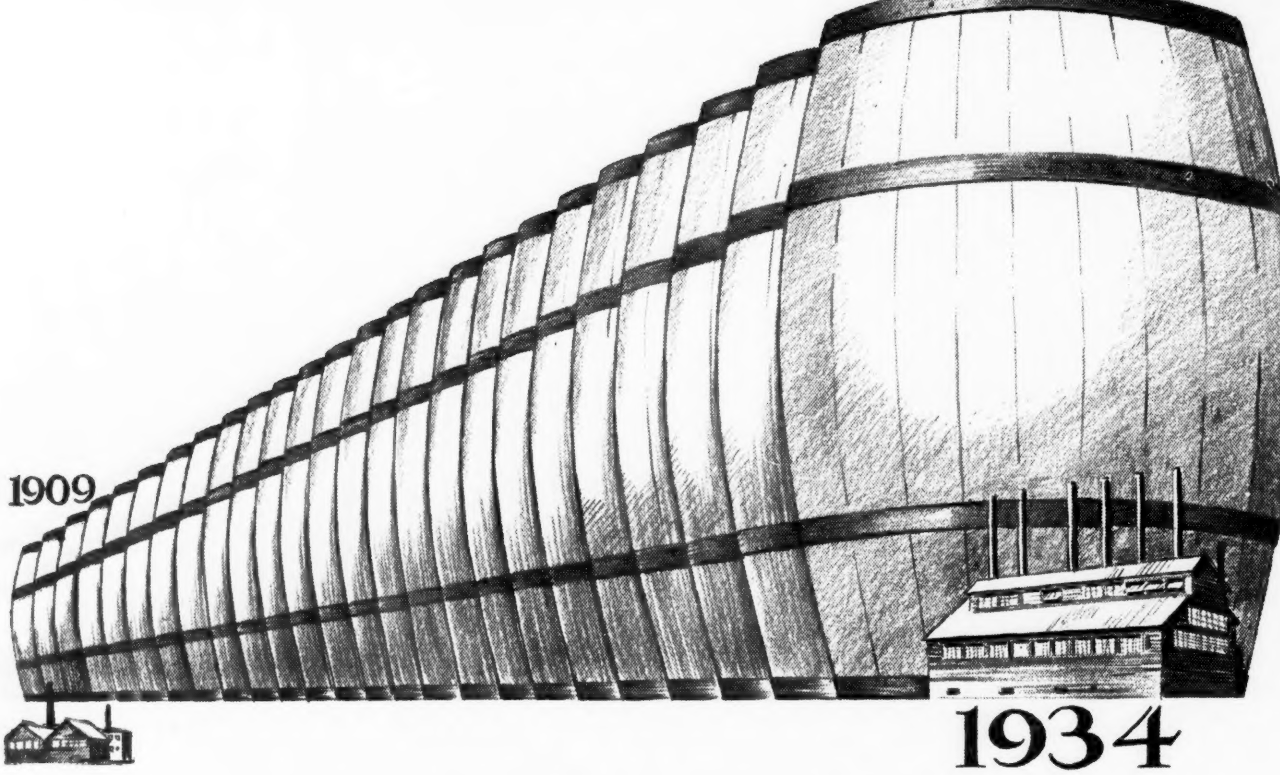

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CHEMICAL INDUSTRIES

VOLUME XXXIII NUMBER 6

Thoughts on Experiments

WE IN the chemical world know something about experiments. Chemistry was established as a science by experiment, and in the workaday business of making chemicals better and cheaper we are constantly carrying on thousands of experiments. Since Paracelsus---that is, during four centuries---we have been indefatigable experimenters, and quite recently two of our most experienced, successful research men have summed up what the chemist has accumulated in these long years of practical research:

> When he wanted to learn more and learn it faster he invented experiment. Experience alone was not only too slow but was much less trustworthy. He learned that to be truly revealing, experiment must be carefully planned and controlled and the initial plan continually revised in the light of new facts as they come out of experiment. He learned that Nature, like us humans, can answer but one question at a time, so that if he wanted to learn the effect of more than one variable condition he could best do so by studying the influence of each separately, that is, by causing one at a time to vary and holding the rest constant. He learned, furthermore, the importance of "blank" or control experiments, particularly if there were a number of variable conditions whose influences were to be studied... But experiment is not always possible. When it can be employed, it is the most direct and fruitful method of fact-finding. When it has very limited application, as in sociologic research, we have to fall back on careful, detailed record of many observations of naturally occurring events related to the problem under investigation; then by so-called statistical methods endeavor to arrive at significant relationships, which would escape ordinary, hit-or-miss observation.

It is just this inability to control the conditions under which any economic research may be conducted; the impossibility of isolating for exact observation one factor at a time; the extreme difficulty of studying results in the open-minded, disinterested, scientific spirit vital to authentic conclusion, that make it quite impossible to carry on economic experiments which bear the slightest resemblance to our chemical experiments. The human element upsets both the experiment and the experimenter. You cannot, as Governor Smith suggests, turn us all into a nation of guinea pigs. But because this is impossible, such an "experiment" is more honestly called a "gamble".

We believe we face a new economic day. We welcome changes in the economic scheme with confidence in the future. We are convinced it is a time to take some chances, but do not want to delude ourselves into thinking a new economic system can be worked out by experiment as we might build up a new synthesis or discover a new element.

Styles in NRA Administration Emphasis shifts in NRA more swiftly than styles in women's hats. First, re-employment; then, wages; later, collective bargaining; and recently, control have been General Johnson's chief concern. This is natural, but it is disconcerting; and it reveals what a consummate cruelty it was for the Government to ask business to think out details of a program it had not itself thought through.

These switches in NRA plans are more than uncomfortable. They have resulted in progressive changes in code objectives that will result in inequalities. For example, with the big industries coded and present interest centering on enforcement, the Administrator is now setting up code authorities quite different from those provided in say textiles and automobiles. He appears to be keen to get vital statistics of cost from groups which have no intention of attempting to so control competition. He also wants to set up elaborate enforcement machinery far too costly for some small industries to support. These moves are naturally regarded as further unwarranted extensions of the NRA authority and do not make the blue eagle more popular.

Government Research Defenders of the Government's research activities make a mistake in stressing its "practical" aspects. In the first place, it is most dubious whether any sound case can be made out on the basis of a strict *quid pro quod* of dollars return for the taxpayers' money spent upon these so-called practical investigations. Secondly, industrial research is so obviously a function of industry itself, and when so carried on with a definite monetary aim has been so successful, that it is not easy to justify public expenditure for these practical purposes.

Economy programs have very much curtailed all kinds of scientific work by both federal and state agencies. Already a barrage of the old research ballyhoo is being laid down to restore these appropriations. It is a very good time to consider the pros and cons of public research in order to discover what it is necessary and worthwhile to pay for out of taxes and what is either senseless duplication or quite outside the realm of proper Government service to the taxpayers. In many cases these are difficult questions to answer; but it is plain that with so many demands upon the public purse, no scientific work should be undertaken that cannot unequivocally meet these two plain requirements:

1. The public at large must be direct beneficiaries of the results, and sophistry must not twist this into benefits primarily for any group, or section, or special interest. Obviously Pennsylvania might conduct a research to make coal mining safer and North Dakota might experiment with seed wheat on this basis that would be utterly inappropriate for the Federal Government to support.

2. No research that even in part duplicates work being done elsewhere should be undertaken. This has been the most obvious and flagrant waste. What a silly thing it is, for example, for dozens of states all to analyze the standard brands of fertilizers, when this might be done by one cooperative laboratory and paid for by the different states pro rata to their fertilizer consumption? To cut out duplications would save millions to the positive improvement of the services rendered.

Such prerequisites, if scrupulously required, would confine publicly subsidized research to fundamental or specialized work that no interested group can do for itself. This would create more private positions than the scientists released from public service could fill, and the gain would be vastly greater than the millions of public funds saved. The spread of direct, personal, dollars-and-cents interest would make for a wider, more intelligent appreciation of research, and the removal of governmental scientific work from commercial activities would give us a needed haven for the ideals of pure science.

Making Profits in Paper Dollars Dr. Landis' article on just how inflation affects the day-by-day conduct of a chemical business is based on the careful study he made during his recent trip to Europe. He gives the following practical advice: try to sell and buy as much as possible in the terms of some staple foreign currency and carefully conserve your working capital. Be careful how you raise cash by the sale of common stock or you may upset the control of your company. Keep all raw material requirements well covered, and last but not least, extend credit with the uttermost caution. Read his article, for it is one of the most timely and valuable we have ever published.

What is the day by day effect of serious inflation upon business? A practical answer to this question was sought by Dr. Landis on his recent trip to Europe, and here are set forth the careful observations and wise conclusions of this competent chemico-financial expert.

Inflation and the Chemical Industry

By W. S. Landis

Vice-President, American Cyanamid Co.

ARE we going to have inflation? Will administration use the inflationary powers granted? We are not going to have it; we have it already and to a quite unknown extent.

We are as truly off the gold standard as were any of the European countries following the close of the war. Our currency value is already partially set by the foreign speculator, just as theirs was at the worst of their inflation. Our dollar has lost value outside the country to an extent at least half as great as France when she "stabilized". Our national budget is as unbalanced as were those of European countries we know as first-class inflators, and it is not improving in this respect. The Administration's purchase of Government securities, (while today largely a bookkeeping matter, that is, establishment of credits by Federal reserve banks) places an obligation on these banks to redeem those credits at any time, and one means of redemption is fiat money, more paper dollars. Our citizens already hesitate to invest in Government bonds. Present quotations are probably fictitiously maintained by the Reserve bank purchases. We are right up against the "greenback" issue. Present inflation could be worse only in degree.

The unit in which we measure value is the dollar. We conduct our business in that unit. Today's value of that unit is based solely on the whim of some theorist in Washington tempered by the cupidity of some foreign speculator. And, such a measuring unit is supposed to be the basis of our commercial life! Could anything be more nonsensical? How can business prosper with such a foundation? How can we lift ourselves out of a depression with such a handicap?

One of the worst features of inflation is its habit of sneaking into our daily lives undiscovered by the great mass of our population. The politician, aware of the record of disaster behind it in a dozen European countries, introduces it under an alias. He disguises it in various ways hoping we will not recognize it. He is aided by the fact that some phases don't show themselves for a considerable time. There may be months between cause and effect. This has lulled many into the belief that we would not be subjected to this cancer.

Since we are in inflation what should the business man do to give maximum security to his venture, his stockholders, his employees, his customers? He is only a drop of water in the great ocean, carried along in its great currents. He is rather helpless amid the great waves. Yet he can swim and float and help somewhat.

In the first place his liquid working capital is inordinately shrunk. His planned program, which set aside what he thought would be adequate funds, has come to naught. Cash adequate for last year may be totally inadequate for this or next. Without ready funds he must close up or borrow. Since inflation is commonly supposed to reduce debts, the idea of borrowing or the creation of new ones seems crazy. But the real truth is that inflation does not eliminate debts. It may temporarily shift them; it usually replaces them with larger ones. A creditor cheated by inflation is rarely caught in the same manner again. These new debts will carry insurance, burdensome conditions and charges, that will make the old ones look light, for the creditor has learned his lesson. All this tells us to watch our liquid assets, hold on to what we can of them, spread them to the limit. Do not take on new burdens that will increase demands on the shrinking bank accounts.

Of necessity a considerable time interval elapses between sale and delivery, even if it is some goods from stock for immediate shipment. Some interval occurs between manufacture and delivery, and equally important, receipts of payment for the invoice rendered. We cannot avoid this. The execu-

tive measures all these time factors in dollars, and in turn sets a dollar price. If this dollar is a fixed unit, it is no great problem to determine the resulting profit or loss. When the dollar constantly fluctuates, such determination requires a super-mathematician. When we pay one kind of dollar for raw materials, another for wages, still a third for taxes and overhead, and get back in return a fourth kind of dollar, one must admit the complexity of the problem of determining whether we gained or lost on the transaction. Worse than that we should determine the value of each of these four kinds of dollars before we make the sale, otherwise we are going it blindly, and profit becomes a matter of luck with odds greatly against us. If these several dollars are valued by theory and speculation a fine guessing contest is on.

European Experience

Europe found long ago that business could not be conducted and survive on such a basis. The principle of setting a high enough price to enable approximately an even break might be worked out, were it not for the fact that some men in business are not clever. They are unable to carry through such a complicated calculation as indicated above. They set what they think would be a profitable price, usually inadequate, and competitors must close up or meet it. This becomes just a straight knockdown—drag-out fight, and continues until the financially weaker competitor goes into liquidation. Here is a case where with the best of intentions the conservative business man may fail. We can't call it cut-throat competition, for even our mentally weaker brother may have used his best business intelligence to uphold the price structure. Inflation was just a new factor and too much for him.

Europe took care of this situation by selling all futures in terms of a stable foreign currency. The Swiss franc and the dollar became favorites. Where exchange restrictions hindered such sales on a direct foreign currency basis, the same end was attained by using the exchange value as quoted at a given prescribed place and date to calculate the actual delivery price.

Now, however, the whole world is wobbly in its monetary structure. It is very difficult to pick such a currency, with any assurance of stability. We cannot use gold, if my legal friends are right in their interpretation of the present law. The commodity index is an absurdity. We all know the politician will be always changing the type of index to get one most favorable to his constituents. There seems to be no way today to guarantee a firm future commitment that will not cause suffering due to inflation.

Prices sooner or later fully reflect the lessened value of the dollar. One cause of the lag has been discussed above. Now the costs of our raw materials are subject to all the influences mentioned above. They are largely commodities. The rush to cover pushes up the price; the attempt to conserve wealth by placing it in commodities helps raise prices. All work together. One is only covered at a known cost when the goods are in the yard. I do not know whether inflation causes a lowering of the standards of business morality or not, but in stress of inflation failure to deliver seems much more common than usual. Many times there is no recourse.

A counterbalancing situation arises. The rush of wealth into commodities means large stocks in hands of speculators and non-consumers. At the faintest suggestion of stabilization they are unloaded, demoralizing the market. The poor manufacturer is between the devil and the deep blue sea, he must carry stocks to insure deliveries, yet those very stocks become a source of weakness on the merest rumors of stabilization or revalorization.

Inflation is largely a painless method to cut wages, that is true wages. In France this true cut amounted to about 50% of pre-inflation wages, in Germany to very much more. However, in our paper dollar terms and on which our accounting is based, during inflation one must expect a rise in paper wages. We must be prepared for a regular and continuing rise in this item of cost. It becomes a heavy draft on the liquid working capital. Unfortunately the lag of wages behind the dollar fools many executives, and they estimate on the short side. Where sales are made in a stable foreign currency the concern profits by the effect of inflation of the dollar.

Effect of Taxes on Business During Inflation

Taxes have little effect on business during inflation. Being levied only once in the year they became decreasingly small as inflation proceeded. Insurance however becomes a problem. Insurance companies have difficulties in remaining solvent. Accounting becomes more involved, if inflation proceeds to any great degree, as the figures used become larger. Credits are much more difficult to handle. Purchasing requires extreme skill, as the purchasing agent is presented with a future which he has to appraise as being fair as of date of delivery, and has to assure himself he will get the goods.

The Treasurer is confronted with no new problem but rather a continued repetition of the old one of handling his funds to maintain their true value so far as possible and yet always have sufficient ready cash. Borrowing is not the simple problem that one might think it is. Capital flees the country in large amounts. Bank deposits shrink in true value though apparently may be increased in paper. But these bank deposits are subject to extraordinary call due to the stage-like process in which prices and wages increase. The savings banks and savings accounts disappear not immediately, but as soon as the general public gets the idea that there is no merit to savings when one draws out of the bank a less valuable dollar than he puts in. The tendency is to spend everything earned for commodities or to get it out of the country. In

general, therefore, sources of capital from which such borrowings are made disappear. The cost of borrowing becomes frightful. The creditor demands excessive premiums, insurance and high interest rates; and a study of commercial loans in Europe shows that in practically all countries, where inflation had proceeded to any material extent, commercial loans brought anywhere up to 20 and even 30 per cent. interest. Even after stabilization this situation only slowly cured itself because the capital had fled the country, the habits of saving did not immediately return, the fear of a repetition of inflation still persisted in a great mass of people, all of which forced extraordinary interest rates on borrowings.

Inflation Brought Currency Shortage

In most European countries that carried inflation to a high degree, there was an actual shortage of currency. The amount of coin and paper in circulation was insufficient at various times to carry on even the decreased business activity of the country. The German railroads were forced at times to issue their own script. Most of the large corporations found themselves unable to accumulate enough paper (not by reason of their financial condition but by the fact that enough did not exist), in order to meet payrolls and were forced on to script. Of course, these are extreme cases but nevertheless they frequently happened in countries, like Austria and Germany, who attempted to issue metal tokens in the early days of inflation in order to meet the growing demands for currency. Frequently the metal tokens, due to the time required for processing, had no value when they were ready and therefore did not come into circulation. This created a gap in the program of the Government for meeting the currency issue. Poland tried aluminum money in the early days and by the time it was coined it would have been of no use. Germany made two issues of aluminum currency, neither of which got into circulation and there was no substitute. Metal money just seems to evaporate in an inflation.

The executive himself is forced to decide a very serious question. Business mortality is high among concerns whose management is unable to cope with inflation. There is, therefore, a great tendency to absorb these institutions. They can be acquired comparatively cheap. However, their failure was due to lack of working capital in almost all cases or at least to exhaustion of their working capital and, therefore, such absorption can only be contemplated upon most intimate study of the resources of the absorbing company. Can its available working capital meet not only its unknown future needs but also those of the property absorbed?

Will the purchasing power of the declining wage schedule warrant trying to maintain these units in production? In general domestic business declines as inflation proceeds, and more and more reliance has to be put upon export. There is no question but that a number of German companies survived inflation on the basis of their export business. Since the German inflation, however, the world has had much schooling in control of imports. Many nations have learned how to change tariffs, raise duties, adopt dumping clauses, and establish quotas in a way then unknown. This must not be lost sight of, for it is an effective embargo which has had good practice. Practically no free markets exist today where there is any purchasing ability in countries that once were important foreign outlets for manufactured goods. Another new factor has come into play in recent times: the rationing of currency or even the blocking of foreign payments. Both Europe and South America are rather skilled in these tricks and have added a new and unmeasurable hazard for the credit manager to battle with.

As inflation proceeds the paper quotations of common shares increase. These rising prices indicates a real demand for this type of security. In these times of stress the executive may undertake to use this means of fortifying working capital. One cannot question this procedure during inflation periods. But when stabilization ultimately results we find an enormously swollen capital structure which may be extremely unwieldy. How this can be condensed to a normal size is a great problem. In Europe this caused many failures, particularly due to the fixed par share. Legislation in some countries requires this par to be 100 or multiples thereof. The no par share is practically unknown. They call it an "American invention" but do admit some merit as useful when it came to deflation.

Hazards Attending Stabilization

In closing I want to bring up another hazard, that of stabilization. Stabilization takes place in several ways. The British accumulated gold through open market operations probably influenced to some extent by the Government or sympathetic banks. With this growing stock of gold and through friendly manipulation of the currency markets the pound was left to find its own level which happened to be the old parity. England then resumed gold exchange which continued until 1931. The French accumulated gold, in fact never lost very much as a large part of the French gold is in the hands of the peasants. The banks gradually accumulated this from the peasants by offering higher prices and left currency to drift in the meantime. It fluctuated widely at times but ultimately settled, probably under some guidance, at around 25 francs to the then dollar and after holding reasonably constant for a while France announced that she was prepared to stabilize at a certain number of milligrams of gold to the franc which gave it a value of around 3.94 cents in terms of the dollar. She made these francs redeemable in gold at this new basis. The German stabilization was quite a different character. The Government initiated a new currency, the Renten mark, based upon land and commodity back-

ground and simply decreed by law that all transactions and all accounting as of October 1, 1923, should be transferred to the new Renten mark, the ratio of transfer being one trillion paper marks for one Renten mark. The mechanism of transfer of this accounting was quite elaborate, but enormous numbers of booklets, treatises and instructions appeared and the shift was made. The companies immediately brought out new balance sheets, appraising their properties, inventories and the like in terms of the new mark and recalculating their reserves, surpluses and cash items at the prescribed devaluation rate. The Renten mark passed over into the Reichs mark of the same value and, therefore, there was no complication in the second transfer. The Reichs mark was redeemable in gold at identically the same gold rate as the prewar German mark.

Wages and Prices vs. Stabilization

All this sounds very much like a matter of mere mechanical accounting. It is by no means the whole story of stabilization and corporate affairs. Raw materials increase in price as the currency unit decreases in value subject, of course, to a lag which I have mentioned before. This lag varies in time from a few months where the currency is being rapidly devaluated to a year where the changes are slight. People get into the habit of looking for rising prices during inflationary periods and when stabilization is effected the habit persists and prices continue to rise for sometime after the date of stabilization. The laborer becomes used to a continued rise in wages and expects the same to continue even though stabilization has intervened. History shows that wages do rise after stabilization until they take up the slack occasioned by the lag just mentioned. Of course, there is conflict between the employer and the workman during this period and labor troubles multiply enormously.

At the first suggestions of stabilization those persons, and by those I mean practically everyone with any capital whatever, be it even infinitesimally small, who have attempted to preserve their wealth in the form of common stocks and commodities dump these holdings on the market. This brings about a panic on the stock exchange and a complete dislocation of the commodity markets. Even manufactured goods suffer where inflation is carried so far as in most of the European countries, for the small householder has purchased everything available in the shops. When the farmer sold his corn he immediately invested in farm equipment if he could find any, or if not in almost any material available in the nearest shop. I know cases where the farmer had seven or eight wagons. He needed only two. I have been in houses where they had dozens of pairs of shoes, many of which could not be worn by any member of the family. This shows how even the smallest individual hedged his wealth. Now all this demoralized trade and in the several European countries there followed depressions of longer or shorter duration, which began coincident with rumors of stabilization and culminating as these rumors became more definite. These periods of depression lasted all the way from six months to practically two years. I do not want to be misunderstood in referring to these periods of depression. Inflation has set all European countries back to an enormous extent. None of them have recovered anything like pre-inflation activity. This stabilization depression was just an extra dip in the line. It was extremely sharp. For example, in Germany hardly a wheel turned over for several months after the Renten mark came into effect and it was six months before they got straightened out. The casualties of stabilization were enormous. Those corporations that had issued great numbers of shares found themselves obliged to condense the ratio bearing from less than 2 to 1 up to as high as 1,000 to 1. They did not have the no par share in Europe and if I recall rightly the new stabilization law was followed in Germany by a decree that new shares should have a par of 100 and that all quotations should be based on 100. The prewar shares of German companies had various par values usually in multiples of 100 or in round divisions of 1,000, such as 250, 500 and the like. Some of these condensations practically wiped out old stockholders particularly where the new issues were sold on the open market. That is why so very few German companies show any conservation of capital through investment in their shares. Bad feeling on the part of the old and original investors who were practically frozen out was inevitable and resulted in the complete overthrow of the management of many companies.

Stabilization affects contracts in the currency of the country, and may affect them even if expressed in foreign currency. Foreign quotations of the currency usually fluctuate considerably just prior to the stabilization and, therefore, even a quotation in foreign money may not be quite satisfactory to the seller after stabilization.

Industry requires a long time to strike its pace after a period of inflation. Large amounts are sunk in fixed assets that may never be operated, this method being a hedge against the inflationary destruction of corporate or personal funds. On the other hand this same hedge has benefited some industries which have taken opportunity to revamp and modernize their equipment. It destroys the principal sources of capital, namely, the bank deposits, savings deposits, insurance reserves, etc. It makes almost impossible the funding of borrowings in long term debts. The great lack of capital in Europe at the end of the several inflationary periods drove borrowers to America and they paid high rates. Remember it was only recently that the interest rate on commercial bank loans in Germany dropped below 8 per cent. Following inflation, therefore, one must figure for some time on a greatly increased cost of money.

Workmen's Compensation
A Fast-growing Racket

By P. W. Gumaer

While the number of accidents and the total of hours lost have been declining—thanks to safety work—the claims paid on workmen's compensation have been growing rapidly, because the administration and interpretation of these laws have been stretched far beyond the original intent. No other group of industries are so vitally concerned as are the chemical manufacturers, and this article lays bare the foundations of this new racket.

IS WORKMEN'S compensation facing a crisis leading to a complete breakdown of the whole system of benefits to injured workmen? The trend in this direction has been obvious for some time to executives and insurance men. Recent events have brought it to the attention of the public.

In Massachusetts the Glenwood Range Company was compelled last April to discharge forty-two employees because of difficulties in securing compensation insurance. X-ray examinations of the workmen showed some symptoms of silicosis. Most of the men were able to work and desired to continue employment. The employer was anxious to give them work as they were skilled workmen. The state authorities and even the Federal Secretary of Labor for several months have been endeavoring to reach a solution of the problem. Another signpost indicating the trend is the move by the compensation insurance companies to abolish schedule rating on December 31st.

The first states to adopt workmen's compensation laws followed the experience of European countries, in that, workmen's compensation was restricted to accidental injuries caused by some sudden, unexpected or exceptional happening peculiar to the occupation in which the employee was engaged. The first mention of occupational disease liability was in the Swiss Federal law on employer's liability in factories, adopted March 23, 1877. Section 5d of this law required the preparation of a schedule of hazardous occupations as follows: "The Federal Council shall also specify those industries the exercise of which demonstrably and exclusively gives rise to specific dangerous diseases, to which liability as defined for accidents shall extend." England in 1906 extended her compensation law to include occupational diseases which originate from risks inherent in the nature of certain occupations and which can be traced to occupational origins in individual cases.

Occupational disease is of particular interest to the chemical industry as the term usually means an injury to the health of workmen caused by exposure during his employment to various chemicals such as lead, benzol, arsenic, etc. Foreign countries and several states, for example, New York and New Jersey, have scheduled the specific occupational diseases that are compensable. Some states, such as Wisconsin, describe occupational diseases as diseases growing out of and incidental to the employment. Others, such as California and Massachusetts, include occupational diseases in the workmen's compensation law by a broad interpretation of the word "injury" to mean, as well as accidental injury, any injury to the health of workmen arising out of and in the course of employment. Connecticut is more specific by defining occupational disease as a disease peculiar to the occupation in which the employee was engaged and due to causes in excess of the ordinary hazards of employment as such.

Foreign countries still adhere to the original purpose that, to be compensable, an accident or an occupational disease must arise out of a hazard peculiar to the employment. If a structural steel worker is injured by a fall during the construction of a building, that is a hazard peculiar to the occupation of a structural steel worker. Industry readily admits the justice of compensation for this special hazard and willingly co-operates with insurance companies and labor officials toward an unbiased administration of its benefits. If instead of falling, the steel worker had caught pneumonia due to exposure at his work, that would be the result of a hazard to which all persons are exposed more or less, whatever their occupation. The awarding of compensation in the latter case is in reality a form of free health and life insurance.

Although the cost of this award may be borne in a particular case by the insurance company, industry must eventually bear the burden through greatly increased rates for compensation insurance.

The original purpose of workmen's compensation laws has been progressively altered in the United States by amendment, administration, and interpretation in the courts until today the employer is rapidly becoming the indirect insurer of the lives, health, and earnings of his workmen. Whatever the merits of industrial health insurance or unemployment insurance or old age pensions may be, they certainly do not deserve to masquerade under the name of workmen's compensation.

Industry's Heavy Investment in Accident Prevention

During the past twenty years industry has spent large sums in accident prevention and first aid facilities to protect their employees against accidental injuries and occupational diseases inherent in the nature of their employment. Accurate figures for occupational accidents or fatalities prior to 1926 are not available. The best estimate for earlier years is that of the Metropolitan Life Insurance Company. They estimate the death rates per 100,000 white males over 14 years from occupational injury to be 45.7 in 1913, 35.8 in 1925 and 31.0 in 1930. The National Safety Council figures beginning in 1926 are more accurate and detailed. Fig. 1 shows the trend of disabling injuries per million of man hours of employment (1926=100%) as reported to the National Safety Council by the following industries: Chemical, Food, Paper & Pulp, Petroleum, Public Utilities and Steel, from 1926 to 1932. During this period the total injuries were reduced 61.5%, injuries resulting in death or permanent total disability showed a reduction of 32.2% and permanent partial disability 39% while temporary injuries were reduced 62.6%. Although these figures may not represent exactly the total occupational injuries in the United States they may be taken as a rough measurement of the sincere efforts of industry to protect its employees against injuries arising out of and in the course of employment.

Fig. 2 shows the workmen's compensation losses (1926=100%) incurred by 60 insurance companies from 1926 to 1932. As the costs of adjusting claims and other expenses are omitted the curve indicates the trend of the cost of compensating workmen for injuries which are claimed to arise out of their employment. Workmen's compensation being a means of relieving the distress of workmen and their dependents due to loss in earning power brought about by injuries arising out of and in the course of their employment, the cost to the employer, as measured by insurance premiums, is based upon the total payroll of the employer for a particular year. The United States Department of Labor indices for employment and payrolls are also shown on Fig. 2. As the number of accidents per million man hours has been reduced since 1926, one would expect the compensation insurance losses to fall below the payroll index curve. Obviously that is not the case.

The lower curve of Fig. 3 shows the trend of total lost time accidents since 1926. It is obtained by multiplying the index of the lost time accidents per

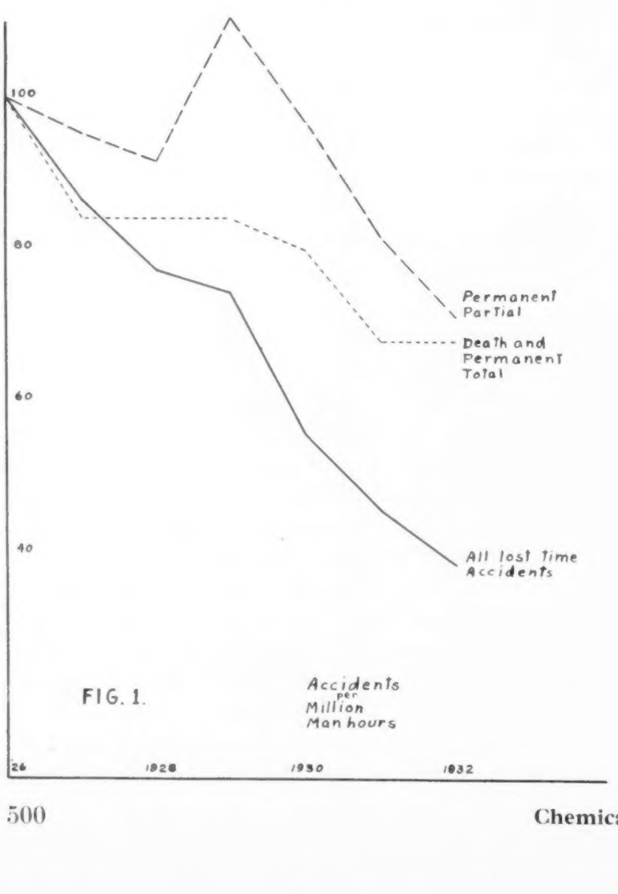


FIG. 1.

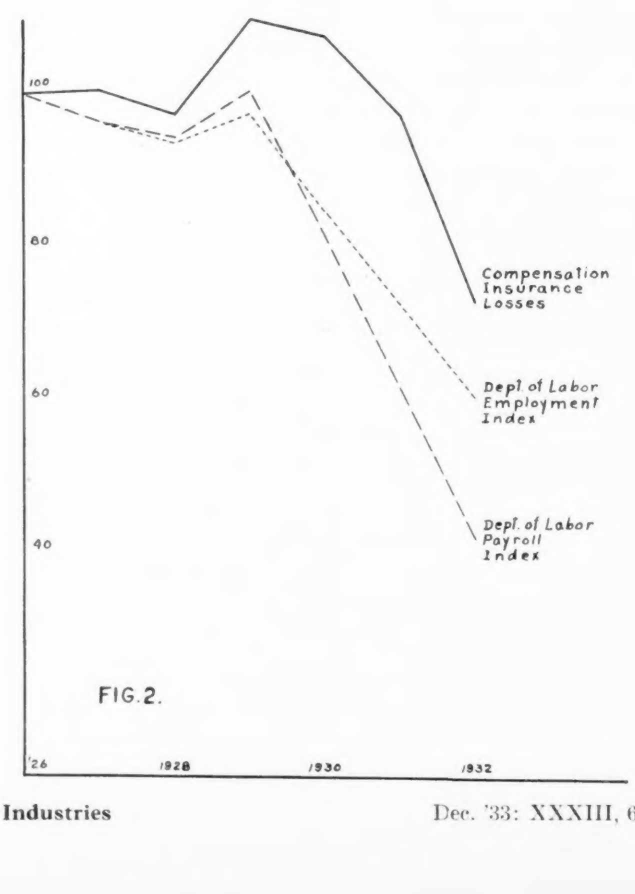


FIG. 2.

million man hours by the Department of Labor employment index representing the number of men employed. The result is conservative, as the Department of Labor index represents only the number of men employed and does not take into consideration the reduced working hours due to part time employment. The upper curve shows the compensation insurance losses expressed as a per cent. of the Department of Labor payroll index. As workmen's compensation represents a loss in wages as a result of injuries arising out of employment, the annual insurance losses throughout the United States should have a definite relation to the total annual payroll in the United States. That is, if the injuries remain constant the ratio of the two curves should also remain constant. Instead of following the downward trend of the lost time accidents the curve shows a slight increase until 1929. Since 1929 the curve has climbed at an alarming rate in spite of the downward trend in the number of accidents. These graphs, while open to some criticism due to the diversified data used (it is the best available), do indicate the trends. The divergence of the two curves since 1929 is so extreme that errors due to the sources of the data must be of minor importance. The curves substantiate the comment in the opening paragraph concerning a possible crisis in our system of workmen's compensation.

Let us examine a few of the causes of the present unfortunate situation. Keep in mind that the original purpose of workmen's compensation is to compensate employees for accidental injuries or occupational diseases that originate from risks inherent in the nature of their occupation and in excess of the ordinary hazards of everyday life. The following decisions are quoted to indicate how far we have departed from the original purpose:

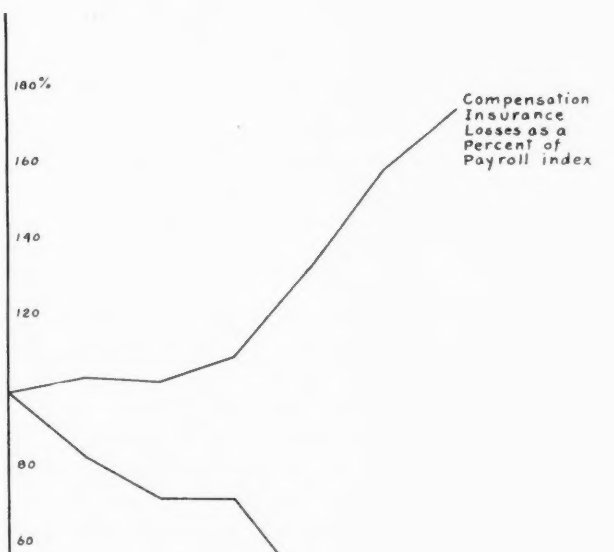


FIG. 3.

Pneumonia caused by bumping his knee;

A watchman died of erysipelas and pneumonia. There was hearsay evidence that he had bumped his knee in his employer's engine room ten days before. Death benefits were awarded to his widow. Upon appeal, the award was affirmed. —Woodman v. Fur Co. (N. Y. Appellate Division).

Accident was an insect bite;

A traveling salesman's automobile got stuck in a mudhole while on the road to business. In getting it out he was bitten by infected wood tick, from which he contracted mountain fever and died. Held that the injury was by accident arising out of and in the course of the employment.—Roe v. Boise Grocery Co. (Idaho Supreme Court).

Some newspapers would call this suicide;

Decedent was employed as a title examiner. On a very hot day in summer, he left his desk and, as was not uncommon in the office, went to the roof of the building for air and relaxation. While there he fell from the roof and was killed. No one witnessed the fall. Held, that the fall was to be presumed to have been accidental, and that it was "in the course of" the employment.—Fuller v. Title Guarantee & Trust Co., (223 App. Div. N. Y., 204).

Typhoid fever is also an accident;

A salesman, while on the road, with his meals paid for by the employer, contracted typhoid fever while eating lunch at a restaurant where a "typhoid carrier" was employed. Held that the disease was an accidental injury arising out of and in the course of the employment. Johnson v. Smith, (New York Appellate Division).

Let's forbid all heavy work when temperature is over 90:

A laborer, while loading trucks with dirt was overcome by heat. The thermometer registered 91 degrees in the shade that day. Held, that the injury was compensable.—Case P. E. 34682, Ohio Industrial Commission.

Fainting too is accidental;

A car cleaner ran a sliver in his finger and asked another employee to remove it. The latter employee proceeded to do so, some blood flowed and he fainted, fell off the car platform and was injured. An award of compensation to the latter employee was sustained on appeal.—Pullman Co. v. Industrial Accident Commission; (California District Court of Appeal).

At training camp for salesmen;

An employee was in camp at a training school for salesmen. One night a severe storm blew down his tent and he was drenched and caught a cold which developed into acute arthritis, necessitating hospitalization. Compensation was denied; but upon appeal the decision was reversed and the case remanded with directions to award compensation.—Tallis v. National Cash Register Co., (New York Appellate Division).

A social visit;

One Sunday morning, between 1 and 2 o'clock, a field solicitor of a produce company, after spending the evening in a village shop, returned home, and, while attempting to garage his car, was killed. No one witnessed the accident. The gathering in the village shop was social, but, in one conversation, there was reference to business. Death benefits were awarded to the employee's mother. Upon appeal the award was affirmed.—Crowell v. American Fruit Growers.

En route to a new job;

A laborer signed a contract to work for a logging company at a lumber camp, boarded a train owned and operated by the

company to go to the camp, but was injured in a collision on the way before reaching the camp or doing any work. Held, that the injury arose in the course of and was incidental to the the employment and was therefore compensable.—Wabnec v. Clemons Co. (Washington Supreme Court).

Slipped on ice in his own back yard;

A salesman and collector sustained an injury by slipping and falling on the ice in his own yard. It was established that he had gone home to get a bill he was to collect and that he had no specified hours of work. Held, that the injury was sustained in the course of his employment.—Ohio Industrial Commission, Ohio Industrial Commission Monitor, March, 1931.

Picking his own cherries;

A minister fell and was injured while picking cherries off a tree at his parsonage. Held that the accident occurred in the course of his employment and was compensable.—Miller v. State Workmen's Insurance Fund, Pennsylvania Bureau of Workmen's Compensation.

Repairing his own auto at home;

A salesman, who was paid compensation for his use of his own automobile in his employer's business, was fatally injured at his home while repairing his automobile preparatory to starting on a trip on his employer's business. Held that the injury arose out of and in the course of his employment.—Johnson Fruit Co. Case, (Nebraska Supreme Court).

Fell down own door steps;

A woman employee of a village newspaper read proof and gathered news. She habitually gathered news items on her way to the office and had no definite time for arriving there. One morning on emerging from her home, to go to work, she slipped on the door step and broke her leg. Held that the accident arose out of and in the course of the employment—one justice dissenting on the ground that there was no evidence that she was going to gather news on the way to the office that day.—Tafft v. Stafford, (New York Appellate Division).

Carbon monoxide in own garage;

A man employed as an auditor had, according to custom, been using his own automobile in his employer's business, but, the weather being extremely cold, he decided to garage his car and proceed on the way to his next work by train. He accordingly took the car to his own garage and there died as a result of carbon monoxide poisoning. Held, that the accident arose out of and in the course of the employment.—Pressed Steel Co. v. Industrial Commission (Illinois Supreme Court).

En route to outing;

An employee was injured while being transported by direction of his foreman to an annual outing given by the employer to his employees and for attending which the employee was to receive his full day's wage. Held, that the injury arose out of and in the course of the employment.—Stakonis v. United Advertising Corp., (110 Conn. 384).

Even dancing;

The employer, which operated a large retail dry goods store, one evening gave its employees a dinner in its building, after which there was dancing. While dancing, one of the employees, a saleswoman, fell and fractured a wrist. Held, that the accident arose out of and in the course of employment.—Kenny v. Lord & Taylor, (254 N. Y.)

Paper towels are dangerous;

An employee cut his eye on a paper towel during a ten minute period on company time allowed him to wash up. Held, that the injury arose out of and in the course of the employment.—Boyerton Casket Co. Case, Ohio Industrial Commission, O. I. C. Monitor.

Putting on own overalls;

An employee fell and sprained his ankle while putting on his overalls, in his employer's plant, preparatory to going to work but shortly before the time for work. Held, that the accident occurred in the course of the employment.—Farm Tools Co. Case. (Ohio Industrial Commission).

A very hazardous occupation;

A young woman clerk sprained the muscles of her side while leaning over the arm of her chair to recover a piece of paper from a waste paper basket, resulting in temporary total disability. Held, a compensable injury.—Colonial Finance Company Case, (Ohio Industrial Commission Monitor).

What is the value of a dead man's eye?

By an accident, an employee lost an eye and suffered other injuries which soon resulted in death. The Industrial Board awarded compensation to the widow for death only; but, upon appeal, it was held that the widow was entitled to full benefits plus a schedule award for the loss of an eye.—Keenholtz v. Bayer Co., (New York Appellate Division).

Sprained ankle causes infected finger;

A young actor sprained his ankle by tripping over a spear he was carrying. Later an infected part of a finger had to be amputated. Compensation was awarded for such loss on the theory that the finger trouble was due to an infection which traveled to the finger from the sprained ankle, through the blood stream; and the award was affirmed upon appeal.—Wilson v. Philadelphia Theater Ass'n, (N. Y. Appellate Division).

If you can't get a job you are totally incapacitated;

Where an award for total incapacity had been set aside on appeal and the case remanded, with directions to make an award for partial incapacity, the Commissioner reopened the inquiry, found that although the incapacity was not strictly total yet that it was such as to prevent the injured man from obtaining any suitable employment and thereupon renewed the award for total incapacity. Upon second appeal, held, no error.—Reilly v. Carroll, (110 Conn. 282).

If your salary has been cut you have partial disability;

A workman, who previously earned $53.60 per week, after recovery from temporary total disability, obtained work at $9 per day but for only 4 days per week, owing to the prevailing depression. Compensation for partial disability was awarded upon the basis of a reduction in earning capacity from $53.60 to $36 per week. Upon appeal the award was affirmed.—Polizzi v. Cuddihy, (New York Appellate Division).

And these quotations are not isolated examples. If space permitted hundreds of other decisions could be cited that are just as foreign to the fundamental purpose of workmen's compensation.

Where is it going to end? It is a mathematical certainty that the upper curve of Figure 3 cannot keep on increasing at its present rate without disaster.

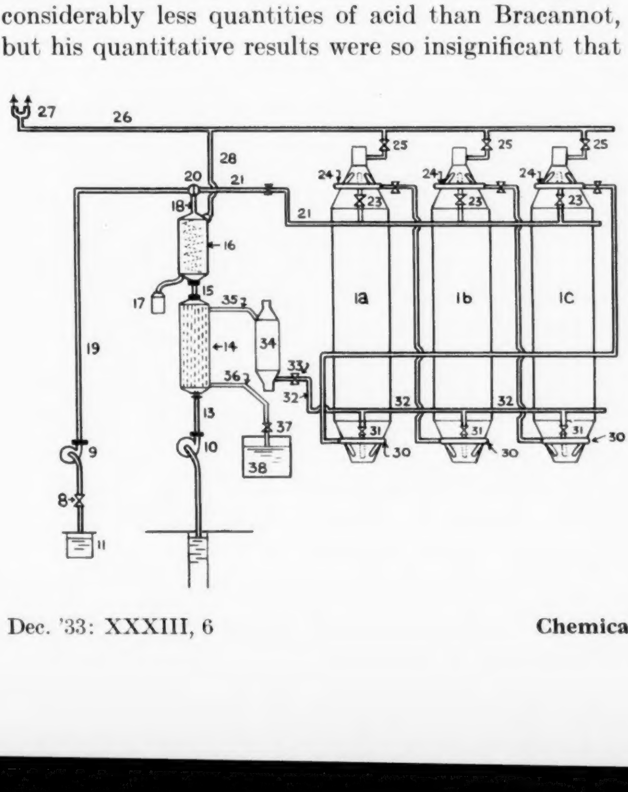
If the extension of workmen's compensation to provide relief for misfortunes other than injuries for which industry is actually responsible is not stopped and a breakdown occurs in the system of compensation payments the *chief* sufferers will not be the employers or the insurance companies but the injured employees and their dependents who legitimately are entitled to benefits under the compensation law.

Sugar and Alcohol from Wood

Some notes on the development, operation and costs of manufacturing processes assembled and translated from the German by Alfred Hurter, Consulting Engineer, London.

IN THE second decade of the last century, the French analytical chemist Bracannot succeeded in completely converting cellulose into sugar by means of treatment with concentrated sulfuric acid. Even at that time his discovery created a great sensation scientifically and economically. This new realization indeed proved fundamental to further research in the field of cellulose chemistry. It was thus proved that the elements of cellulose are exclusively sugar and that it is possible to convert cellulose to its original condition. But Bracannot's technical achievement did not prove a success. The very considerable consumption of acid and the difficulty of recovering the acid while working with concentrated acids, bar the economic utilization of this method.

In spite of the fact that the following decades brought about an immense advance in chemistry, achieving also the industrial manufacturing of beet sugar, it was only in the year 1856 that new epochs in this development of the saccharification of cellulose are recorded. In the same year S. F. Melsens reports of experiments for the saccharification of cellulose with diluted acids combined with heating. He required considerably less quantities of acid than Bracannot, but his quantitative results were so insignificant that



his process failed to attain economic importance. Almost simultaneously Béchamp described the effect of concentrated hydrochloric acid.

Subsequently Dangeville (1880) evolved a new procedure: the saccharification of cellulose with concentrated liquid or gasiform hydrochloric acid at low temperature obtaining satisfactory output, allowing also the recovery of the hydrochloric acid by distillation. The technical difficulties, in connection with the distilling of concentrated hydrochloric acid, frustrated Dangeville's efforts and his process was soon forgotten. On the other hand, the saccharification with diluted acid was further developed 18 years later, in the year 1898, by the Swedish scientist E. Simonsen, and in the following years became the subject of numerous works by others. The Americans Ewen & Tomlinson, in the year 1909, created in Georgetown an industrial process of saccharification with diluted acids. Their consumption of acid was reasonable, but their practical results regarding output were as insignificant as those of their predecessors. They only secured about 6 litres of alcohol out of 100 kg. of dry wood substance. Nevertheless their process must, at that time, have been on the borderland of economy, for when the factory in Georgetown was burnt down in 1913, new works were erected, which are said to have been running until 1916.

According to Bracannot's process a sugar output of 60 kilograms, corresponding to a spirit output of about 30 litres, should be obtained from 100 kilo of wood. One wonders, therefore that a process for the manufacturing of alcohol from wood has been employed, which only yields one-fifth of this output. This, however, finds its explanation in the important technical advantages obtained by working with diluted acids as against working with concentrated acids. Whereas the process working with concentrated acid necessitates four periods, i. e., the drying of materials, the treatment with concentrated acids, the recovery of the acid and the converting of the carbohydrates into a fermentable state, one can, by the use of diluted acids, in one single process, obtain fermentable sugar

from moist or even wet cellulose material. The recovery of the acid is unnecessary, as the small amount of acids required can readily be abandoned. In the meantime, in Germany in 1913, Willstaetter, Zechmeister and simultaneously Wohl, discovered the action of over-concentrated hydrochloric acid upon cellulose, whereby the saccharification with concentrated hydrochloric acid attracted renewed attention.

During the war Germany required large quantities of sugar for the preparation of glycerine, resulting in a great shortage of sugar. The consequence was that the manufacture of sugar and alcohol from wood was practiced on a very considerable scale. Diluted acid was used according to the processes developed by Simonsen, Classen, and Ewen and Tomlinson, and factories were erected in many places. From August, 1918, to September, 1919, the total output of the Stettin works amounted to 150,000 litres of alcohol. But, as in America, 100 kilograms of dry wood substance yielded only 6 litres of alcohol. All through 1919 the attempt was made to keep the works going, but the insufficient output proved to be economically unsound. In consequence of these failures, the saccharification of cellulose with diluted acid was generally looked upon as uneconomical. This opinion was upheld among others by Prof. Bergius and shared by Hagglund in his book "Holzchemie" (Woodchemistry 1929, Page 183). It was considered impossible to increase the output by any technically practicable means.

Research on Saccharification

After the war, research on saccharification with concentrated hydrochloric acid was taken up with renewed zeal. Notable outputs and the possibility of the recovery of the hydrochloric acid acted as a stimulus. In accordance with Willstaetter's results, Hagglund, Bergius and their colleagues worked out the "Rheinau" process, while the "Prodor" process of Levi and Jerrisse may be looked upon as the continuation of Dangeville's work. Both the "Rheinau" and the "Prodor" processes were put into operation at Geneva, Switzerland, in 1927 and 1928, but the manufacture was again abandoned, since when no other similar works have been erected.

In pursuance of prior research on saccharification of cellulose with diluted acids, renewed studies were devoted to this problem by H. Scholler of the Technical High School in Munich, in Prof. Dr. Luers' laboratory during the years 1922 and 1923. It was ascertained that the poor output up to date was fully explained by the decomposition of the sugar already formed.

Only as late as 1926, Scholler discovered means and ways, whereby the most disturbing decomposition of sugar during the process was eliminated, and thus a big output of sugar was rendered possible by saccharification with heated diluted acids. About 170°C. of hot, slightly acidulous water flows continuously and comparatively quickly under pressure of about 8 atm. (119#) through the cellulose-material, thus carrying away the sugar which is being formed during the saccharification process from the apparatus where the reaction takes place, leaving, so to say, no time for any decomposition. As soon as the sugar solution has left the apparatus, it is cooled, so that further decomposition is avoided. This new method is called "pressure percolation" with diluted acids. In order to guarantee success, the temperature, the concentration of acid, the time of reaction and the swiftness of the flow must be well balanced. By this means 100 kilogs. of soft dry wood substance will yield 25 litres of 100% alcohol (corresponding to 55 imp. gallons per ton).

First Factory for Production

Since the beginning of 1928 the process, conjointly with the Tornesch distillery, was step by step developed industrially and, at the end of 1930, the first large factory of this kind opened at Tornesch proved a complete success. The scientific experiment had successfully been transferred to the industrial stage. The output-figures of the laboratory were substantiated by bulk production and even slightly exceeded.

Professor Luers, referring to a schematic design (see illustration) gives the essential following description: The percolators Ia, Ib. and Ic are cylinders 10 metres high and have a diameter of 1.60 to 1.80m. One of the percolators is lead-plated throughout, the others are lined with acid proof bricks. The brick-lined percolators contain 20,000 litres, the lead-plated contain 25,000 litres. The ends of the cones are fitted with an acid-proof filter for the purpose of separating the sugar-containing wort from the residues.

The small acid-proof pump 9 and the large water-pump 10 are used for the percolating liquids. Both pumps are driven by motors and regulated, so that the proportion of the circulated quantity of acid and the quantity of the required water is independent of the number of revolutions of the joint motor. The acid-pump 9 is fed with sulfuric acid of 40% from the reservoir 11. The pump 10 pumps water through the counterflow heater 14 at a pressure of 10 atm., the water thereby being pre-heated by the inflowing hot wort. The hot water now reaches the steam-heater 16 through pipe 15. The water already warmed to about 150° C. is now heated up to the desired reaction temperature of 160-190° C. by means of fresh steam from pipe 28. Through pipe 18 the heated water reaches the mixture apparatus 20, where sulfuric acid of 40% is added, which, as stated, is pumped through pipe 19 by acid-pump 9. The pumping capacity of pumps 9 and 10 is so regulated, that a circulating mixture of the desired proportion (water containing 0, 2-0, 6% of sulph. acid) is produced. This mixture passes through the distributing pipe 21 and valves 23 into the ringshaped distributor 24 and then flows through the

percolators. Arrangements are provided to switch on the percolators parallel as well as in series. After the hydrolyzing mixture has passed the contents of the percolators and has absorbed the sugar formed, it enters the filter in the form of sugar-wort and reaches the neutralizator 34 through pipe 32. This neutralizator is filled with ordinary granulated phosphate and raw lime, thus extensively neutralizing the sugar-wort during its passage. The phosphate retained by the sugar-wort serves later on the purpose of intensifying the formation of yeast. The neutralized wort now enters the counterflow heater 14, heating the incoming cold fresh-water. The cooled wort then passes the throttle valve 37 and reaches the wort-reservoir 38.

The raw material used in Tornesch consists of woodchips, sawdust, shavings, machine-shavings and raspings. This (soft-wood) material yields, as already mentioned, 25 litres of 100% pure alcohol per 100 kilos of dry wood substance. Naturally, the output fluctuates according to the kind of raw material subjected to the saccharification process. But it is interesting to note that the bark of trees, otherwise almost totally useless, still yielded about 17 litres of 100% pure alcohol per 100 kilos of dry wood substance (4.536 litres=1 imp. gallon).

Based on the assumption of a factory of 60 tons daily consumption of waste wood, a careful calculation, including reasonable overhead charges, 6% interest on invested capital for the installation of the factory and 9% annual depreciation of the machines, the cost price of 1 litre of 100% pure alcohol is less than 20 pf. (corresponding—at par—to 10d. per imp. gallon). As, however, in above calculation of the cost price of the alcohol produced, the raw material (the waste wood used) is priced at 20 marks per ton, or fully 40% of the cost of the alcohol, the latter is considerably reduced as soon as the raw material can be procured at a lower cost.

Technical Simplicity A Great Aid

A great advantage of the process is, that its technical simplicity also enables comparatively small establishments to work advantageously. In such countries, where the waste wood lies scattered about the land and its collection at greater distances is rendered more expensive, in consequence of high freightage, it is of importance to be in a position to carry on the production by numerous de-centralized smaller works.

There is also no necessity for the raw material used for saccharification to be completely split into small pieces. For instance, it does not matter if larger pieces of wood are filled into the percolators, as long as such pieces are embedded in small material. The raw material need also not be dried, it can even be filled into the percolators in a completely wet state.

In addition to the production of alcohol, about 60 kg. of 50% water-containing lignine per 100 kg. of dry wood substance are obtained. For the time being, this lignine is consumed at Tornesch under the boiler. This fuel provides the greater part of the necessary heat and energy for the process, including the fermentation and distilling. The lignine in a dry state has a heat value of about 6,000 (metric) cal., and is easily ground and formed into briquettes. It is practically free from ashes, ignites easily and is also suitable for gasification. It is of particular interest to note that, when finely ground, it can be used directly for internal combustion motors, a fact which has been proved by experiments.

Alcohol and Benzine as Motor-Fuel

At such a low cost price of 100% pure alcohol as obtained by this process, it will be possible to use alcohol as an admixture to the benzine for motors without adding to the cost of the motor fuel. This means a huge, regular outlet for the manufacture of alcohol.

Numerous chemical products, which, in consequence of the high cost of alcohol, cannot at present be produced at reasonable prices, could, in future, be manufactured much cheaper.

The possibility of producing yeast on a large scale as a highly albuminous cattle-fodder, may be furthermore pointed out. The sugar worts from wood form an initial material for yeasts. By adding nitrogen and phosphates, the economic production of easily digested albumin is ensured.

Maize of Advantage in Process

In places where maize can be produced cheaply enough in great quantities, the process can also be advantageously combined in such a manner that, by means of a mash-process, sugar worts are produced from the sweet-corn, but also by saccharification of the otherwise useless stalks and leaves of the maize plant, according to the Scholler process. It may also be mentioned that other industrial branches, dealing with the production of lactic acid, butyric acid, citric acid, glycerine and similar articles, will be glad to buy cheap alcohol in quantities.

The ideal, appealing to the analytical chemist, would naturally be the complete technical utilization of all wood and lignine components, which, for the time being, are simply used as fuel. Let us hope that chemical research work will succeed in also producing valuable substances from the lignine. That would mean the crowning of Scholler's successful, extremely interesting and promising process.

The Author wishes to express his thanks to Drs. H. & K. Scholler and Prof. Dr. H. Luers for their cooperation in preparing this paper.

Chlorinated Rubber in Paints

By Dr. Wilhelm Krumbhaar

Two years ago chlorinated rubber was first suggested as a basis for the production of paint media. All paint and varnish men were very much interested in it, and in spite of its high price the material was tried out in an enormous number of tests all over Germany. It was thought that chlorinated rubber would prove to possess all the good properties of rubber without the unfavorable features which make ordinary rubber unsuitable to painting technique.

In Germany today four different kinds of chlorinated rubber, which differ only slightly from one another, are available; in outward appearance they usually resemble sawdust, but with a slightly yellower tone, although one type assumes a very voluminous, loose, wadding-like form. Chlorinated rubber is practically ash-free and almost free from residual solvent, so that it is practically odorless. Good quality material gives pretty clear and water-white solutions. Suitable solvents for chlorinated rubber are benzol, toluol, xylol, and solvent naphtha. The viscosity of the solution is dependent on the chlorine content of the rubber, and decreases with increasing chlorine; in general, a solution in toluol containing 20 per cent. solid content has lacquer consistency.

This disadvantage of having to use these solvents arises from the fact that they cause undercoats of all kinds, especially red lead, quickly to soften and lift; in addition, they are not very much in favor with the painters, on account of their action on health and nose. Tetralin also possesses solvent power for chlorinated rubber, but it remains in the film, so that even after several days such paint will not be really dry. Ester-like compounds dissolve chlorinated rubber to a certain extent, and therefore may be added to ordinary solutions made with benzol hydrocarbons and so on, but practical use is made of this method only exceptionally. Chlorinated rubber is nearly insoluble in alcohol and petroleum hydrocarbons, so that very small quantities only of these materials may be added successfully to ordinary solutions of chlorinated rubber. Brushing properties and smell may be improved a little by so doing.

Dried chlorinated rubbersolution—that is, the simple chlorinated rubber film— possesses no elasticity, and is brittle. Unfortunately, the essential features of rubber are lost by chlorination, and it is obvious that this kind of film would possess no weather resistance. In fact, such films crack and flake completely after a few months only of outside exposure. Further, the adhesion of films of plain chlorinated rubber is very poor; they detach immediately from polished metal, and can be easily removed from surfaces not really rough. Most painting faults of chlorinated rubber paints arise primarily from bad adhesion, and this weakness is accentuated by another property, which of itself is a matter of merit—namely, the impermeability of the film to gas and water.

A pure chlorinated rubber film is, equal thickness being assumed, from 5-10 times less permeable to vapor than a linseed stand oil film. As mentioned, the low permeability of simple chlorinated rubber films acts unfavorably on the adhesion, and the behavior of the paint film is rather like that of other impermeable paints, which tend to crack and flake badly. In this connection it is interesting to note that recently the German State Railway, as a consequence of this kind of experience, has abandoned the use of so-called alkali fast paints, which contain high proportions of tung oil, and are consequently highly impermeable.

The resistance of pure colorless chlorinated rubber films against water—that is, the swelling resistance—is relatively small; thus, when dipped in water, they very quickly become white. Resistance to water and aqueous solutions of alkali and acids only develops when the film is pigmented. Resistance against solvents corresponds to the solubility of the chlorinated rubber; thus the film is only resistant to alcohol and mineral spirits, and not to benzol and allied hydrocarbons.

Chlorinated rubber films do not burn with an open flame when in contact with fire; they only char, but

this property does not hinder the film from being destroyed by fire. A question which is particularly important from the standpoint of use is the stability of the chlorine combination in the chlorinated rubber molecule. Practical tests show that there is no completely stable chlorinated rubber. It easily decomposes at temperatures of 150° C., and this decomposition by heat is fairly rapid even at 100° C. If, for example, a chlorinated rubber film is heated in aqueous silver nitrate solution, silver chloride is formed, or if a chlorinated rubber-toluol solution is heated to boiling-point and blue litmus paper is placed in the vapor, the litmus paper becomes red, usually after about five minutes.

A pure chlorinated rubber film shows signs of decomposition at ordinary temperature under the action of a mercury vapor lamp or a bright incandescent arc in the course of a few hours. Bright copper plate painted with chlorinated rubber solution, for instance, discolors to a greenish black when exposed to the rays of these lamps. But the film itself, on exposure, does not yellow or discolor.

Effect of Plasticizers

While pure chlorinated rubber is, therefore, not completely stable to light and heat, it was earnestly and to some extent successfully tried to make it stable for use in paints by combining it with suitable substances. Nitrocellulose is quite incompatible with chlorinated rubber. The usual plasticizers have proved to be satisfactory, particularly dibutyl phthalate, of which, in general, 5-8 per cent. is used. Chlorinated diphenyl and certain chlorinated naphthalenes are also recommended, although they might share the possibility of splitting off chlorine. Certain synthetic oils have been found to be suitable for chlorinated rubber, but, on the other hand, the so-called DSO oil was not satisfactory, since it did not posssess the properties claimed for it in the literature.

The elasticity and weather resistance of chlorinated rubber can be considerably improved by the addition of plasticizers; in particular, a high resistance to blows can be imparted, a property which has significance for the painting of iron pipes. The permeability, swelling resistance and adhesion of the film are scarcely affected by the addition of less than 10 per cent. plasticizer; the stability to light and heat, however, is considerably improved. Higher additions than 10-15 per cent. are not desirable, since the chemical resistance against alkali and acid is thereby reduced by a very considerable extent, and thus the most important feature of chlorinated rubber is destroyed.

Satisfactory products are obtained by combinations with certain soft synthetic resins, also with soft coumarone resins and soft bitumen or tar. In such combinations the brittleness and poor adhesion of the chlorinated rubber is overcome without the chemical resistance being at the same time markedly reduced. Soft phthalic resins are particularly suitable for this purpose. Hard resins are not suitable, since on account of their own brittleness they cause an increase in brittleness of the film.

The problem of combining chlorinated rubber with drying oils—for example, linseed oil and tung oil,—is much discussed. Chlorinated rubber decomposes markedly at 150° C., and therefore cannot be heated with oil in the usual way to form a homogeneous body. One can only dissolve it in the oil at 100° C., or add the oil to a chlorinated rubber-toluol solution. In the film the oil acts as a plasticizer, but after complete drying it is usual for some brittleness to develop; and, indeed, these observations hold true for thin linseed oil and tung oil as for the corresponding thick-heated stand oils, and also for blown linseed oils. Therefore, combinations like these prove a failure in practical use.

As mentioned, chlorinated rubber gives a film essentially less permeable to vapor than the oils, and it was naturally tried to make use of this property in oil chlorinated rubber combinations in which the oil component is in excess, for instance, in the ratio of three parts of oil to one part of chlorinated rubber. Contrary to all expectations, tests with linseed stand oil showed that the gas and vapor permeability of such films is not only lessened, but is actually increased by the addition of chlorinated rubber, probably due to the fact that chlorinated rubber and oil do not combine to give a homogeneous body. Also the swelling of the stand oil films was increased by the addition of chlorinated material. This was clear by the very rapid softening and whitening when the films were dipped in water.

Pigments have a considerable stabilizing effect on chlorinated rubber; not only those which combine with hydrochloric acid, such as zinc oxide, red lead, etc., but also indifferent pigments such as carborundum, iron oxide, micro-asbestos, etc. The reason for this stabilizing effect may be that they particularly function as protectors against light. Thus it is obvious that pigmented chlorinated rubber films are more weather-resistant than clear films.

At the same time, the addition of pigment reduced the swelling properties of the film considerably. The adhesion of films to the painted surface is, however, by no means improved by pigments, not even by a sharp edged and very hard pigment, such as carborundum. On the other hand, the resistance to blows of chlorinated rubber films is markedly improved by pigment mixtures of silicon carbide and micro-asbestos.

From the above it is seen that on the basis of chlorinated rubber in correct combination with suitable soft resins and pigments, a paint can be obtained which is very water resistant, unusually resistant to chemical and mechanical influences, and also non-inflammable. The practical uses of such paints are, however, unfortunately very limited.

On account of the softening action of the solvents on undercoats, these paints cannot be applied by

brushing to surfaces which have been primed in the usual way. The spraying of chlorinated rubber paints is not usually possible, since the material forms web-like threads in the air.

Chlorinated rubber paints are, because of non-inflammability, suggested for painting wood. There are, however, few advantages in this use. The danger of fire with wood is reduced by any paint in which the paint hinders the drying out of the wood, by closing the pores and by making the surface smooth. Chlorinated rubber paints are not suitable for fabrics of any kind; experience has shown that the resistance to tear of fabrics is, as time goes on, considerably reduced, probably on account of the destructive action of the chlorine products liberated. Chlorinated rubber paint can be used on gypsum plasters, cement and stone when special acid resistance is desirable, but paints of the usual consistency do not penetrate very deep into the pores of plaster surfaces; they are, therefore, economical in use, but, on the other hand, the adhesion to the surface is not very good.

Chlorinated rubber combinations can always be used for paints for metals, especially iron, where no particular weather resistance, but good resistance against chemical action is required. The difficulty here lies in the proper previous treatment of the iron surface, which, above all, must be sufficiently rough for the paint to adhere. The adhesion of the rubber paint to pipes of the usual kind, where the surface is rough, presents no difficulties, and the good resistance of the paint to blows is of particular advantage during transport of the pipes. Thus, in fact, large quantities of chlorinated rubber paints have been used for pipes. After the painted pipes have remained in the damp ground, however, in many cases, corrosion occurred; the rusting started especially in small spots, probably due to the splitting off of hydrochloric acid. This initial corrosion is gradually aggravated by the attack of electrical earth currents. Considerable rusting has been known to occur in other cases where chlorinated rubber has been used as an outside paint for iron constructions.

Potash Purification

Effects of particle size, temperature of extraction, and sodium chloride concentration have been investigated in multistage extractions of calcium polyhydrate:

Satisfactory concentrations and recoveries of potassium sulfate may be obtained on −35 +100-mesh, −20-mesh, and even on −10-mesh polyhalite. The coarser the material the longer the time required to attain maximum concentrations in the first step. Secondary reactions which tend to remove potassium sulfate from solution are less serious when the coarser calcined polyhalite is extracted. Results show that materials as coarse as 10-mesh are suitable in a countercurrent process.

Temperatures approaching boiling point are desirable in all stages of extraction, excepting the final. Temperatures approximating 25°C. were used in the final extraction step, but possibly a higher temperature should be used since, in the presence of a low concentration of sodium chloride, both syngenite and polyhalite were decomposed at 50° C. without the formation of any pentasalt to yield a solution containing 4.3 grams of potassium sulfate per 100 grams of water.

Presence of sodium chloride is advantageous in securing higher concentrations and recoveries of potassium and magnesium sulfates during the hot-extraction steps. Amount of sodium chloride that may be used is limited, since high concentrations decrease the subsequent recovery of potassium sulfate in certain proposed processes involving the evaporation of the extract liquors. No special difficulty is encountered unless the sodium chloride in the polyhalite exceeds 1/5 of the potassium sulfate present. This quantity of sodium chloride will yield 2 to 2.5 grams of sodium chloride per 100 grams of water, a concentration sufficiently high for good results during extraction.

Concentrations of potassium sulfate and magnesium sulfate obtained at any time are the net result of two competitive actions; first, the solution of the soluble components from the calcined polyhalite tending to raise the concentrations, and second, the formation of secondary reaction products tending to decrease the concentrations. When material of fine particle size is extracted the rate of solution is rapid, but the rate of formation of secondary products is also accelerated. Extractions at temperatures lower than 100°C. show a decrease in the rate of solution without material change in the rate of formation of secondary double salts. Coarse material dissolves more slowly and appears to favor a slower rate of formation of secondary products. .

When calcined polyhalite is added to hot potassium sulfate solution, in the first stage of countercurrent extraction, voluminous quantities of syngenite are immediately formed. As the extraction is prolonged, polyhalite appears as a new solid phase and the syngenite originally formed begins to redissolve, due to the fact that polyhalite is the stable solid phase under the conditions of the top stage of the extraction system. Apparently formation of polyhalite and decomposition of syngenite proceed simultaneously. Sodium chloride retards the formation of secondary polyhalite and probably decreases the rate of formation of syngenite. It is known that sodium chloride increases the equilibrium concentration of potassium sulfate at 25° C. when syngenite and gypsum are the stable phases. There is some evidence to indicate a similar effect at 100°C. in the top stage of the extraction, resulting in a lessened tendency toward the formation of metastable syngenite.

The second and third stages in the earlier tests and the second stage only in the latter tests represent the rapid decomposition of the syngenite formed in the first step and the solution of soluble portions of the calcined polyhalite not dissolved in the top step. This solution and decomposition of syngenite is effected without any appreciable formation of pentasalt ($K_2SO_4.5CaSO_4.H_2O$), although the latter is the stable phase under the conditions of the second stage. The non-appearance of appreciable quantities of pentasalt during this portion of the process is a very important consideration, as it permits the ultimate removal of practically all of the potassium sulfate originally present. The conditions which favor the formation of either polyhalite or pentasalt are to be avoided, since but moderate amounts of either product may be decomposed in the last or final step of the extraction process with the amount of water available.

Final step of the extraction process represents the decomposition of any residual syngenite not dissolved in the previous steps, together with the solution of a portion of the secondary polyhalite and any pentasalt present. Concentrations of from 11 to 11.5 grams of potassium sulfate per 100 grams of water with recoveries as high as 97 to 98% should be possible in the presence of 2 to 2.5 grams sodium chloride per 100 grams of water. In the absence of sodium chloride or with but small amounts, both the concentrations and recoveries will be lower. A study of the Properties of Texas, New Mexico Polyhalite Pertaining to the Extraction of Potash, U. S. Bureau of Mines, Report of Investigations 3210, J. E. Conley and F. Fraas.

Apprentice boys washing dyed goods in a Japanese village

Dyes and Dyeing In Japan

By Charles E. Mullin, D. Sc.

JAPAN is the only country in the Far East that manufactures synthetic dyestuffs and, although it imports considerable quantities of certain dyestuffs, she has already succeeded in establishing a considerable export market in other parts of Asia for her domestic dyestuff manufactures.

Although most of the dyes are manufactured in large plants, Japan probably has a larger proportion of very small dye manufacturing plants than any other country. These small plants, of course, only make the azo dyes from purchased intermediates, mostly imported and, on account of the high summer temperature in Japan, many of these small plants operate only in cold (winter) weather. Direct blacks are a favorite product of these small plants and even this is often so inferior in quality that it must be mixed with imported dyes to give a satisfactory product. Most of the domestic production consists of direct and basic classes, but of course includes many acid and mordant dyes. Most of the acid, mordant, sulfur (other than blacks), and vat dyes are imported from Germany, Switzerland, and the United States, with England and France supplying smaller amounts.

As in many other countries, the industry was first developed during the World War and the government has encouraged and assisted in every possible way, by tariffs, by subsidies for certain products, etc. Probably the Mitsui Kozen Kabushiki Kaisha (Mitsui Mining Company) was the first to make the widely used alizarine red, at Miike, Kyushu, in 1914. Some 360 tons of dyes were manufactured in 1915, and by 1929 some 7,812 tons, which was claimed to have supplied about 75 per cent. of the domestic demand. During the War it was estimated that about 149 dye manufacturing plants were in operation but this had been reduced to about 40 by 1930, all of which received some government aid.

The first law of subsidies, under which the dyestuffs manufacturing industry operated, was enacted in 1915. This was slightly revised in 1925. The first dyestuffs tariff bill was passed in 1920 and a second in 1926. These were revised in 1928 and 1929, and extended to 1934.

Drying and stentering the Yusen style printed silk in a small Japanese finishing plant. When desired, a starch or other finishing paste is applied by brushing during the drying in the sun, and artificial heat is never used.

The German-Japan dyestuff agreement was made in 1928, under which some sixty dyes and intermediates are imported only with the consent of the Japanese government. By far the largest part of the dyestuffs importation business is in the hands of the I. G., which maintains an excellent corps of fully trained German and native technicians and full laboratory facilities for every branch of the dyestuffs consuming industry. The Ciba Company, which sells only through D. Nagase and Company, also maintains a technical dye application expert in Japan. The American firms and the Imperial Chemical Industries do some business also, and the Du Ponts have done considerable business in intermediates, especially with the small manufacturers. The competition at present is quite severe, and the rapid decrease in the gold value of the yen has made it increasingly difficult to do business in imported products.

The Nihon Senyro Seizo Kabushiki Kaisha (Japan Dyestuffs Manufacturing Company) is believed to supply about 83 per cent. of the sulfur dyes produced in Japan. The Teikoku Senyro Seizo Kabushiki Kaisha (Imperial Dyestuff Manufacturing Company), the Hotoya Soda Kabushiki Kaisha (Hotoya Soda Company), and the Osaka Chemical Company are also among the largest producers.

Japan first exported sulfur black to China in 1916, upon a small scale. Larger exports, and including methyl violet, congo red, etc., began in 1918, and some dyes have been sent to India. These dyes are all widely used in the East and, with indigo and a few other direct colors, constitute almost the whole of the dyestuffs business in the Far East, outside of Japan. With the return of European dyes in the Japanese markets after the World War, the local producers experienced increasing difficulties and were almost forced out of business until they received protection in 1920 by a duty of 35 per cent. ad valorem. In 1926 the tariff on basic, direct, acid, mordant, acid mordant, sulfur, vat, and oil-soluble dyes was increased to $39 to $94.00 per 132.27 pounds (100 kin). At the same time the importation of the most widely used and easily manufactured dyes was restricted, including congo red, sulfur black, rhodamine Bextra, croceine scarlet, mordant yellow, etc. In 1929 *B*-naphthol and hydroxynaphthoic acid and their derivatives, which had formerly been admitted free, were placed on the tariff list at about 30 per cent., ad valorem.

The Japanese industry is able to meet the domestic requirements for the most commonly used dyes, including aniline salt, etc., and formerly met about half the requirements for many other products, including some of the alizarine dyes, the total production amounting to over 5,289,000 pounds in 1930. The number of dyes manufactured has increased each year and more recently both hydrosulfite and some of the simpler vat dyes have been made. The consumption of indigo in all parts of the East is very heavy, particularly in China, and both the Japan Dyestuffs Manufacturing Company and the Miike Dyestuffs Works have succeeded in producing synthetic indigo on a small scale. It is claimed that neither the yields nor the costs of production are satisfactory but it has resulted in bringing synthetic indigo under the Dyestuffs Regulation Act of 1929. Japan normally consumes about 2,650,000 pounds of indigo annually. Dyestuff manufacturing equipment which was at first entirely imported, is now made in Japan.

Dyeing in Japan

The application of dyestuffs has developed in Japan far beyond any other country in the East, including the number and quality of dyes used, variety of dyeing methods, fastness, etc. At the same time Japan does produce a lot of cheap colored goods and prints that are not fast, to meet the demands of the export trade. As a whole, the colors for the domestic trade are fast and include a large proportion of both sulfur and vat dyes. On the other hand, most of the colors are simple shades and the complicated vat dyeing formulas, containing three or more dyestuffs, are almost unknown.

Just as much of the spinning and weaving are the product of the home or domestic industries, so is the dyeing. The best, most beautiful Japanese textiles are from these home industries. As a whole, the larger plants mainly serve the export trade. Only these larger plants dye and finish their own goods. There are many whole communities existing solely on the home manufacture of some one textile specialty or type of fabric. Each community generally does only one type of work and each family handles only one

World Dyestuff Production*

(In metric tons)

Year	*Japan*	*Germany*	*United States*	*England*	*France*	*Switzerland*	*Italy*	*Russia*
1927	7,646	74,800	43,182	17,940	14,015	10,206	6,160	....
1928	8,303	74,800	43,828	23,115	15,603	10,821	6,985	11,000
1929	7,796	75,000	50,540	25,304	16,431	11,044	6,992	12,643
1930	7,780	70,000	39,227	19,319	15,950	9,090	5,800	15,911
1931	a7,500	a67,000	a32,000	21,764	a13,000	a8,500	5,400	a17,000

*From "World Trade Notes," U. S. Dept. of Commerce.
aEstimates by "Die Metallboerse," Berlin.

Dyestuff Exports from Japan and Other Countries*

(In thousand pounds)

Country	*1913*	*1920*	*1923*	*1926*	*1929*	*1930*	*1931*
Japan	......	a.....	2,300	1,000	1,800	4,600	4,500
Germany	240,100	61,500	73,900	81,900	94,700	91,500	96,400
United States	......	a.....	17,900	25,800	34,100	18,000	18,500
England	5,500	13,800	9,200	6,000	15,200	10,200	11,900
France	1,200	7,200	5,000	8,800	5,800	4,600	6,700
All others	100	800	1,500	2,600	2,100	2,400	2,000
Totals	266,400	b107,100	109,800	126,100	153,700	130,300	140,000

aNo figures are available.
bExclusive of the United States and Japan.
*C. C. Concannon, Bureau of Foreign and Domestic Commerce, *Ind. & Eng. Chem., News Edn., 11*, 10 (1933).

operation, such as spinning, weaving, dyeing, or finishing. These domestic goods are usually sold at auction, held locally once or twice a week.

In 1929 there were 12,361 dyeing plants in all Japan employing 52,574 operatives, of which 44,779, or 85 per cent., were males, or an average of a little more than four workers per plant. These plants handled work to the value of $52,127,440, or an average of about $4,220 worth of work per plant in the year 1929. Of the above total, 48 per cent., or $25,440,000 was printing; plain dyeing accounted for $23,150,830 or 44 per cent., and all other kinds for $3,536,600, or seven per cent. Osaka is the leading dyeing and printing center, with a production of $11,187,300. Kyoto is next in importance and is renowned as producing the most beautiful materials in the country. Wakayama, Tokyo, Aichi, Shizuoka, and Ehime prefectures follow in the order named.

It is difficult for one who has not actually visited Japan to visualize these family dyeing plants. They are innumerable and scattered all over the textile sections of the country. They are almost entirely without the mechanical equipment considered so necessary in America. The few employees, outside of the family of the owner, are usually apprentices working at 30 to 100 yen a year, $6.10 to $21.00 at present exchange rates. Everyone in the family does a share of the work. The mother, wife, or grandmother boils up the dye solution ready for use, in the kitchen. The children wind the yarn with the skill of an occidental adult, and the men and boys do the actual dyeing and heavy work. Their equipment is of the simplest type, very inexpensive, often homemade, but sometimes quite novel to Western eyes. Labor is cheaper than anything else and it is not spared.

Practically all textile printing is done in these small home plants with stencils, sometimes using as many as 150 separate stencils on a pattern, of, say, one by two feet. Crude as it sounds, the results are marvelous and include many of the most beautiful textiles in the world. The application of chemistry in these small dyeing and printing plants is in no way inferior to those of the larger and better equipped dyeing and printing plants of the West. Due to the fact that time and labor are much less important than in the West, it is possible to combine many types of work and processes, on the same piece, that would not be at all practical or possible in our production basis methods and plants.

These people have studied the technical literature of the entire world and adapted everything they can possibly use without expensive apparatus and equipment. Many processes that we consider too antiquated and laborious are widely and very successfully used, and combined with other and more modern processes and formulas, in these home plants. These plants have, of course, received invaluable assistance from the many I. G. technical men and laboratories located in all of the large textile centers of Japan. They receive further invaluable assistance from the many government-assisted textile schools, as well as the special government-supported textile laboratories, located in all textile centers.

Sources of Asiatic Dyestuff Imports*

(In thousand pounds)

Country	*1913*	*1920*	*1923*	*1926*	*1929*	*1930*	*1931*
Japan	......	a.....	2,300	1,000	1,800	4,600	4,500
Germany	94,900	18,100	40,500	48,300	48,400	51,400	57,100
United States	......	a.....	15,000	20,400	28,800	22,800	16,200
Switzerland	5,500	5,500	9,000	5,800	5,700	4,700	4,800
England	200	5,000	5,000	2,800	10,700	5,600	6,800
France	600	3,900	700	3,600	800	1,000	a.....
All others	100	......	300	......	......	......	......
Totals	101,300	b32,500	72,800	81,900	96,200	90,100	c89,400

aNo figures available. bExclusive of the United States and Japan. cExclusive of France. *C. C. Concannon, Bureau of Foreign and Domestic Commerce, *Ind. and Eng. Chem., News, Edn.,-11*, 10 (1933).

The larger plants, usually specializing on the export markets, often manufacture only cheap goods and dye, print, and finish in their own plants. However, there are also several very large custom dyeing and finishing plants, such as the famous Ito plant in Tokyo. The equipment of these "modern" plants usually resembles that of the English or European plants of the same type, rather than of the latest American plants, on account of the greater similarity of conditions and labor costs in Europe. The oldest of this machinery was imported from England or Europe but little dyeing and finishing machinery is now being imported, in spite of the steady growth of the Japanese textile industry, as practically all of these machines have been copied and are now made in Japan. In fact many of these Japanese copies have been sold to the Chinese and Indian textile mills.

Sources of Japanese Dyestuffs Imports

(*Value in gold dollars*)

Country	*1928*	*1929*
Germany	\$3,405,000	\$2,678,000
Switzerland	750,000	757,000
United States	466,000	610,000
France	193,000	330,000
England	130,000	36,000
All others	18,000	60,000
Total	\$4,962,000	\$4,471,000

The textile industry of Japan is one of the few in the entire world that has been able to keep up—and even increase—production, year by year, all through the depression. Many of these plants are now running two full-time shifts, which means sixteen to twenty-four hour operation. As most of the large plants specialize almost entirely on the Japanese export market, and China was formerly the best customer, some of them were very seriously affected by the Chinese boycott of Japanese goods, however, the drop in the gold value of the yen, from about \$0.50 U. S. gold to about \$0.20 gold, which of course greatly lowers their labor and overhead charges, has enabled them to enter other and new export markets and so keep up and even increase production. Another method of marketing Japanese textiles, which has been particularly effective in China, is to mark them with counterfeit English labels and trade-marks, pack them in English cases, either in Japan, Dairen, or at some other port, and sell them as English goods. This export business has been a big factor in keeping up the Japanese dyestuffs manufacture and imports.

There were 676 bleaching plants in Japan in 1929, employing 5,773 operatives, of whom 4,511, or 78 per cent. were males, an average of less than nine workers per plant. They handled work to the value of \$5,486,330, or an average of \$8,130 per plant and \$953 per operative, in 1929. Of the goods handled, shirtings came first with a value of \$1,323,790. Again Osaka prefecture leads all others, with bleaching charges of \$2,576,700, with Shizuoka, Kyoto, Aichi, Wakayama, Tokyo, and Hyogo prefectures following in the order named.

The Industry's Bookshelf

Physical and Chemical Examination of Paints, Varnishes, Lacquers and Colors, by Dr. H. A. Gardner, 1,500 p., published by Institute of Paint and Varnish Research, 2201 New York ave., Washington, D. C. \$11.00.

Sixth edition is a thoroughly revised one, brought up to date to include all modern methods for physical and chemical testing of raw materials and finished products. A supplement gives the physical properties of over 1,000 paint pigments with the chemical composition given in many instances. There is a special supplement containing all specifications and test methods issued by the A.S.T.M. for protective coatings.

Handbook of Chemistry and Physics, 1818 p., by Charles D. Hodgman, published by Chemical Rubber Publishing Co., Cleveland, Ohio. \$6.00.

This standard work needs no introduction to the chemist and physicist. The 18th edition has several notable additions and changes, however, that make it much more valuable than its predecessors. Most important is the appearance of a new and wholly revised table of "Physical Constants of Inorganic Compounds." Nearly 1,500 compounds have been added. Section devoted to the elements has been entirely rewritten. Other equally important additions, too numerous for specific mention, have likewise been added.

The Inventor And His World, by H. Stafford Hatfield, 269 p., published by E. P. Dutton & Co., 300-4 ave., N. Y. City. \$2.40.

Inventors are mechanical geniuses who are doubly interesting because of their foibles and idiosyncrasies. The author, who is a scientist and an inventor, tells the story of invention from a practical and philosophic point of view. He indicates the characteristic temperament of the inventor, shows how he works, and he explains why it is so difficult for the inventor to get his invention adopted. Mechanical, chemical, electrical, biological, and psychological inventions are treated fully, and the book contains an invaluable chapter on the Patent Law in the U. S., Great Britain, and Germany. This work is valuable not only to show the inventor the best way to proceed, but to point out to the man who is interested in financing the invention, the best way to handle the inventor and the invention itself.

Air Conditioning, by James A. Moyer and Raymond U. Fittz, 390 p., published by McGraw-Hill Book Co., 330 W. 42 st., N. Y. City. \$4.00.

Here is the 1st complete treatment in 1 volume of this important and rapidly growing field. Moyer and Fittz' book on refrigeration was regarded as a standard text on that field, and in this book they have provided a comparable treatment of air conditioning.

The 1st half of the book covers theoretical fundamentals and discusses such phases of air conditioning as air filtration, refrigeration, humidity control, etc. The 2nd half gives a thorough study of design requirements, including such features as examples of typical air conditioning designs, with the necessary calculations, for theatres, restaurants, food factories, textile mills, etc., relatively complete discussion of reversed-cycle refrigeration as used for the heating of buildings, and attention to recent advances in household, office building, railroad train and theatre applications.

Ammonia Soda Manufacture, by Te-Pang Hou, 365 p., published by Chemical Catalog Co., 330 W. 42 st., N. Y. City. \$8.00.

This book is 1 in the American Chemical Society Monograph Series. In addition to giving a most complete technical review of the processes for alkali production with special emphasis on the ammonia-soda process, book affords a splendid historical resume of the soda industry from its very beginnings. Few divisions of the chemical industry have been so shrouded in mystery and secretiveness as has that of alkali production and this is thought to be the 1st book in the English language of its kind. For this reason alone it is of more than special interest.

CHEMICAL

The Photographic Record

Further exploiting the new uses of transparent cellulose took a long step forward when the new magazine for men, Esquire, presented this miss in The Cellophane Gown.

Courtesy, Esquire—Photograph by Gilbert Seehausen

NEWS REEL

of Our Chemical Activities

One research "gang" visits another. Bakelite officials on the steps of Hercules' Experiment Station—Main Laboratory. Left to right: A. L. Langmeier, Director of sales, Hercules naval stores dept; O. A. Pickett, acting director, Hercules' Experiment Station; George W. Baekeland, vice-president, Bakelite; Dr. L. V. Redman, vice-president and director of research, Bakelite; Dr. E. R. Hanson, Bakelite; L. N. Bent, Hercules' naval stores dept; J. M. Bell, Hercules; D. R. Wiggam, ass't. director, Hercules' Experiment Station, and Theodore Marvin, advertising manager, Hercules.

Dr. Lewis H. Marks inspecting the tail distillers—final stage of distillation of alcohol, at the Continental Distillery Corporation, of which he is the head. Company has announced the perfection of a new process of making pure whiskey in one day which, if established as a fact, will revolutionize that branch of the distiller's craft.

Dr. L. H. Herty scored a two-bagger in the chemical news this month by being appointed Deputy Administrator, NRA, to take care of the chemical industries; and his slash pine newsprint has been used by nine daily newspapers in the South.

Construction is under way on the New England Alcohol Company's plant at the Everett Works of the Merrimac Division. The first unit is scheduled to be in operation by the first of the year, and will have an annual capacity of 3,000,000 gallons, nearly three per cent. of the total production of the country.

Courtesy, Monsanto

The New Chemicals of Commerce

At the Chemical Exposition, CHEMICAL INDUSTRIES collected from its advertisers the new products introduced to commerce by them during 1932 and 1933, and publishes this check-list of these new materials as a catalog of that display and an advance supplement of the 1934 edition of the CHEMICAL GUIDE-BOOK.

ABALYN—A liq. resin derived from abietic acid. Uses: as resin and plasticizer in nitrocellulose lacquers, in cements, adhesives, etc. The Hercules Powder Co., Inc.

ACETAL—Diethylacetal, Ethylidene Diethylether. $CH_3CH(OC_2H_5)_2$. Colorless liq., agreeable odor. Sp. gr. 0.8234 (15.6°C.). B. P. 103.6°C. Sol. alcohol, ether; slightly sol. water. Uses: general solvent, brandy flavors, medicinally as a hypnotic. Niacet Chemicals Corp.

ACETAMIDE—CH_3CONH_2. M. W. 59.05. White cryst. Sp. gr. 1.159. M. P. 81°C. B. P. 222°C. Uses: as solvent, plasticizer, electrolyte; in plastics; organic synthesis. American Chemical Products Co.

ACETIC ACID GLACIAL—Acidum Aceticum Glaciale. CH_3COOH. Colorless liq. Sp. gr. 1.0546 (15.6°C.). M. P. 16.5°C. B. P. 118.4°C. Sol. water, alcohol, ether. Uses: medicinal; chemical reagent. Niacet Chemicals Corp.

ACETOMESITYLENE—$(CH_3)_3C_6H_2COCH_3$. B. P. 126-128°C. at 24 mm. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

ALDEHYDE BISULPHITE—Acetaldehyde Sodium Bisulphite. $CH_3CHOHSO_3Na$. White powder. Sol: water; slightly sol: alcohol. Uses: mfr. aldehyde sulphoxylate, organic synthesis. Niacet Chemicals Corp.

ALPHA HYDROXY—A butyric acid. $CH_3CH_2.CHOH.COOH$. Fine needle cryst. Commercial grade 90-93% pure. Similar in general chemical properties to lactic acid. American Cyanamid & Chemical Corp.

ALPHA-PICOLINE—C_6H_7N. Colorless liq. Sp. gr. 0.950 (15.5°C.). M. W. 93.06. B. P. 129.5°C. Refractive Index 1.50426 (16.7°C.). Completely sol. water. Forms constant boiling mixture with 48% water, boiling at 93.5°C. at 753 mm. Industrial product—boiling range not over 2°C. Uses: mfr. medicinals. The Barrett Co.

ALUMINUM ACETATE 20% SOLUTION—Acetate of Alumina, Red Liquor, Mordant Salts, Printer's Acetate, Liquor Alumini Acetatis. $Al(OOC.CH_3)_3$. Water white to pale yellow solution. Sp. gr. 1.09 (20°C.). M. P. -5°C. Misc. water all proportions. Uses: mfr. color lakes, paints and varnishes; mordant dyeing and printing; waterproofing and fireproofing textiles; in paper and leather, embalming, medicine. Niacet Chemicals Corp.

ALUMINUM CHLORIDE ANHYDROUS C. P.—$AlCl_3$. White powder. Absorbs moisture with decomposition, forming aluminum oxychloride and hydrochloric acid gas. Sp. gr. 2.440 (20°C.). Sublimes at temperatures above 183°C. Iron less than 0.001%. Other metals entirely absent or negligible. Uses: organic syntheses involving use of anhydrous aluminum chloride where high iron content causes discoloration or formation of tars. The Calco Chemical Co., Inc.

A M Y L LACTATE—$CH_3.CHOH.COOC_5H_{11}$. Water-white to pale yellow liq. Sp. gr. 0.954-0.966 (20°C.). Distillation 100% between 75-150° at 20 mm. Acidity—neutral to litmus. Ester content at least 95%. Wt. per gal. 7.99 lbs. Available with the amyl group in its various isomeric forms. Uses: as cellulose ester solvent and plasticizer. Sharples Solvents Corp.

AMYL MERCAPTAN—$C_5H_{11}SH$. Sp. gr. 0.8248 (20°C.). M. W. 104. Dist. range 80-125°C. Vapor Pressure at 22°C. 29 mm. Visc. at 20°C. 0.005566 Poise. F. P. 47°F. Is starting point in the syntheses of many organic compounds. Available as a mixture of its various isomers. Uses: stench; flotation reagent. Sharples Solvents Corp.

AMYL STEARATE—$C_{17}H_{35}COOC_5H_{11}$. Pale yellow liq. Sp. gr. 0.856 to 0.864 (20°C.). Distillation 100% between 230-270°C. at 30 mm. M. P. 15°C. Acidity as stearic acid not over 2.0%. Ester content 97.5%. Wt. per gal. 7.16 lbs. Available with amyl group present in its various isomeric forms. Interesting where high boiling inert plasticizer is desired. Uses: cellulose ester solvent and plasticizer. Sharples Solvents Corp.

ANHYDROUS ETHYLENE CHLORHYDRIN—Ethylene Chlorhydrin, B-Chloroethanol. $Cl.CH_2.CH_2.OH$. Water-white liq., purity not less than 97.5% ethylene chlorhydrin. Sp. gr. 1.0202-1.208 @ 20/20°C. Wt. per gal. 10.06 lbs. Boiling range 122°-135°C. Miscible all proportions with water. Uses: organic synthesis for introduction hydroxyethyl group, preparation of glycol esters, hydroxypropionic acid, malonic acid, phenyl ethyl alcohol (Oil of Rose), novocaine, indigo. Carbide & Carbon Chemicals Corp.

ARTIFICIAL ESSENCE OF PEARS—$C_{12}H_{19}O_2CH_3$. Colorless liq., fruity odor resembling pears. M. W. 200. B. P. 147°/15 mm. Sol. alcohol; slightly sol. water. Uses: flavoring soft drinks and foodstuffs; ingredient perfumes; pleasant odor mask for more objectionable odors. Dow Chemical Co.

ARTIFICIAL ESSENCE OF QUINCE—$C_{12}H_{19}O_2C_2H_5$. M. W. 214. Colorless liq., with noticeable odor of quince. Reacts chemically in manner characteristic of esters. Sol. alcohol; slightly sol. water. Uses: flavoring for soft drinks and foodstuffs; ingredient perfumes. Dow Chemical Co.

ASEPTOFORM—White cryst. powder. M. P. 125°C. Sol: cold water 1-500, hot water 1-100, alcohol 1-5, Gly-Ketol 1-5, vegetable oils and fats 1-50. Non-toxic and non-irritating mold and fermentation preventive. Uses: in agar emulsions, hair wave powders and lotions, cosmetic creams, gelatines, glues, pastes. R. W. Greeff & Co., Inc.

ASTRULAN—A vegetable oil especially treated and recommended for use in the mfr. of all types of white leather. Due to the extremely light color of the oil, it will not impart any color whatsoever to the leather. American Cyanamid & Chemical Corp.

BARIUM CARBONATE—$BaCO_3$. When used in the manufacture of brick combines chemically with calcium sulphate in the brick to form less soluble products. This chemical action tends to prevent efflorescence in the brick. The Grasselli Chemical Co.

BENZENE-THIOPHENE FREE—Colorless liq. Sp. gr. 0.884 (15.5°C.). M. W. 78.05. M. P. 5.4°C. B. P. 80.2°C. Industrial product—boiling range not over 2°C. Uses: solvent; reference fuel in anti-knock rating of motor fuel. The Barrett Co.

BICHROMATE OF POTASH—$K_2Cr_2O_7$. Cryst. form. Maintains exceptional purity. Uses: valuable raw material in many industries, principally in tanning goat skins for production of glazed kid; mfr. certain dry colors where presence of potash is essential. H. B. Prior Co., Inc., Selling agents for Standard Chromate Co., Inc.

BICHROMATE OF SODA—$Na_2Cr_2O_7.2H_2O$. Colorful, cryst. product, exceptional chemical purity. Uniformly dry, free-flowing, and free from objectionable dust. May be had in fine granular form, adapted for use in mfr. of green glass. Uses: in leather tanning, dry color, textile, chromic acid, brass, copper, and other industries where oxidizing agent is required. H. B. Prior Co., Inc., Selling agents for Standard Chromate Co., Inc.

BLUE TONER #3565—A product of tetramethyldiaminobenzophenonechloride on phenyl-A-naphthylamine by patent process to insure permanency. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

BRISGO—A thermoplastic compound derived from rosin. Uses: developed for meat packers as an agent for completely dehairing hogs. The Hercules Powder Co., Inc.

BROMOMESITYLENE—$BrC_6H_2(CH_3)_3$. B. P. 116-118°C. at 25 mm. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

BROWN ER—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

BROWN FN—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

BROWN GBL—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

BROWN MFS—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

BROWN N—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

BUTYL ACETYL RICINOLEATE—Yellow, oily liq., mild odor. Misc. most common organic solvents. Sp. gr. 0.94@ 20/20°C. Sap. No. 235. Saybolt Visc. 123 sec. @ 100°F. Practically insol. water. Approx. 2% water by vol. dissolves in it. Dist. range 220-235°C. @ 3-5 mm. mercury. Acidity approx. 5% calculated as ricinoleic acid. F. P. 110°C. Uses: plasticizer, emulsifier, lubricator, detergent. Commercial Solvents Corp.

BUTYL LACTATE—$CH_3CHOHCOOC_4H_9$. Not less than 95% ester by wt. Water-white, slowly evaporating volatile liq., mild, non-residual odor. Sp. gr. 0.974-0.984 @ 20/20°C. Dist. range 130-200°C. with 90% between 155-195°C. Misc. organic solvents generally. Not subject auto-hydrolysis, nor hygroscopic. Uses: solvent nitrocellulose, oils, dyes, natural and synth. resins; formulation architectural brushing, stencil and imitation suede finish lacquers; spray lacquers to improve gloss, adhesion; anti-skinning agent in and improves flow quick-drying enamels, varnishes. Commercial Solvents Corp.

BUTYL ORTHO BENZOYL BENZOATE—$C_6H_5COC_6H_4COOC_4H_9$. Viscous liq., practically odorless, and non-volatile at ordinary temperatures. Sp. gr. 1.127 (24.2°C.). B. P. 360°C. at 760 mm. Insol: water; very sol: most organic solvents including alcohol, acetone, ethyl acetate, benzol. Uses: as plasticizer. The Calco Chemical Co., Inc.

CABINOL—A blend of terpene chemicals—penetrant, toxic, and repellent; non-poisonous, non-caustic, non-corrosive. Uses: for control of insect borers. The Hercules Powder Co., Inc.

CALCOAG—An iron sulfate coagulant containing chiefly a highly soluble complex hydrate of ferric sulfate. Uses: for purification of water; treatment of industrial and sanitary wastes, sewage, milk wastes, etc. The Calco Chemical Co., Inc.

CAMPHOR, U. S. P.—A synthetic product manufactured from turpentine. In the process, pinene is extracted from turpentine and converted to bornyl chloride, next to camphene, thence to isoborneol and finally to camphor. Synthetic camphor is used largely in the manufacture of pyroxylin plastics. E. I. du Pont de Nemours & Co., Inc.

d-CAMPHOROXIME—$C_9H_{16}CNOH$. M. P. 114-116°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

CAPRYL ALCOHOL—Sec. Octyl Alcohol. $C_8H_{18}O$. Water-white, mobile liq. mild, sweet odor. Non-corrosive. Sp. gr. 0.825. M. W. 130.14. B. P.-C. P. grade 178°-180°C. Pure Grade 174°-185°C. Wt. per gal. 6.8 lbs. Sol: alcohol, ether, organic solvents; insol: water. Uses: mfr. high-boiling esters, octyl

acetate, octyl phthalate, etc. solvent; powerful anti-foaming agent. American Chemical Products Co.

CARMINE LAKE #3171—A product of P-toluidine-M-sulphonic acid and hydro-oxy naphthoic acid. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

CAST RESINOIDS—Basic resinoid is of highly permanent light color, making possible a wide range of color effects. Impact strength high; machining qualities excellent. Fabrication: by machining from heat-hardened cast forms. Uses: for many objects of utility, *e. g.*, jewelry, smokers' articles, lamp stands, boxes, knife handles, gear shift knobs. Bakelite Corp.

CAUSTIC POTASH FLAKE—KOH. Contains not less than 88% KOH averaging about 89% KOH. Uses: mfr. insecticides, disinfectants, soap, pharmaceuticals, chemicals, toilet preparations; processing textiles; in laundries and printing trade. Isco Chemical Co., subsidiary of Innis, Speiden & Co.

CETYL IODIDE—$C_{16}H_{33}I$. M. P. 20-22°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

CHLORACETOPHENONE TECHNICAL—Phenacyl Chloride Technical. $C_6H_5COCH_2Cl$. Light brown, crystalline solid. M. P. 50-53°C. Moisture less than 0.2%. Uses: as tear gas in cartridges, grenades, and candles; effective in concentrations as low as one part in three million of air. The Calco Chemical Co., Inc.

1:4 CHLOR ALPHA NAPHTHOL CRYSTAL—$C_{10}H_7OCl$. Fine, light, crystal. M. P. 117°C. Sol: alcohol, ether, benzol; insol: water. Uses: intermediate dyes. American Chemical Products Co.

p-CHLOROANISOLE—$ClC_6H_4OCH_3$. B. P. 84-87°C. at 18 mm. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

m-CHLOROIODOBENZENE—C_6H_4 Cl I 1:3. B. P. 113-114°C. at 14 mm. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

o-CHLOROIODOBENZENE—C_6H_4 Cl I 1:2. B. P. 119-121°C. at 27 mm. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

CLARIFIED LIQUID CAUSTIC POTASH—KOH. Solution guaranteed to contain not less than 45% KOH. Uses: mfr. insecticides, disinfectants, soap, pharmaceuticals, chemicals, toilet preparations; processing textiles; in laundries and printing trade. Isco Chemical Co., subsidiary of Innis, Speiden & Co.

CREAM AMMONIA—A superior dirt and grease remover, taking place of soap. Useful in the home and for cleaning automobiles. Charles Cooper & Co.

CRESOPHAN (patent pending). $C_{11}H_{16}O$. Alkyl derivative of metacresol. Powerful germicide and fungicide particularly active against pyogenic bacteria and fungi of the trichophyton type. Phenol coefficient 105 against *Staphylococcus aureus*. Uses: antiseptic soaps, athlete's foot lotions; prevent mold and fermentation in cordage, boxboard, paper sizings, etc. R. W. Greeff & Co., Inc.

CROTONIC ACID—1-carboxy-propylene. $CH_2CH:CHCOOH$. White cryst. Sp. gr. 0.973 (15.6°C.). M. P. 72°C. B. P. 185°C. Sol. water. Uses: mfr. resins and esters; prevent sedimentation and gelatinization of varnish driers in volatile organic solvents. Niacet Chemicals Corp.

CRUDE NITROGEN SOLUTION—Contains 45% anhydrous ammonia (NH_3), 45% nitrate of soda, (Na_2NO_3), 10% water. Total equivalent 54% NH_3. Sp. gr. 1.033 at 20°C. Vapor pressure at 20°C. 49 lbs. gauge. Uses: for ammoniating superphosphate fertilizer mixtures. Made by Atmospheric Nitrogen Corp., for The Barrett Co.

CRYSTAL CAUSTIC SODA—NaOH. Contains approximately 76% Na_2O corresponding approximately to 98% NaOH. Uses: as detergent; mfr. soap, dyes, paints, varnishes, toilet preparations, etc; in paper and pulp, printing ink, rubber, and textile industries. Isco Chemical Co., subsidiary of Innis, Speiden & Co.

CUTRILIN—A synthetic bacteria bating material, of which there are many grades, each one recommended for a specific type of leather. American Cyanamid & Chemical Corp.

DAINTEX—A pine oil compound developed to give greater penetration, cleansing, and better color work in laundry and rug cleaning processes. The Hercules Powder Co., Inc.

DELAY ELECTRIC BLASTING CAPS—A new non-perforated, one-piece, all-metal, delay blasting cap with new waterproof and safety features. The Hercules Powder Co., Inc.

p-p-DIAMINO DIPHENYLTHIO UREA SULFATE—$C_{13}H_{14}N_4S.H_2SO_4$. M. W. 356. Light cryst. powder. Uses: intermediate dyes; diazo component and coupling agent. American Chemical Products Co.

DIAMYLAMINE—$(C_5H_{11})_2NH$. Sp. gr. 0.7780 (20°C.). M. W. 157. Dist. range 180-205°C. Visc. @ 20°C. 0.01264 Poise. F. P. 124°F. Slightly sol. water. Very basic in its reaction. Reacts with various organic acids, forming interesting emulsifying compounds. Reacts to form various sulfur derivatives used in rubber, mining, steel industries. Contains amyl group in its various isomeric forms. Uses: as solvent oils, resins, many cellulose esters. Sharples Solvents Corp.

DIAMYL SULPHIDE—$(C_5H_{11})_2S$. Sp. gr. 0.8988 (20°C.). M. W. 174. Dist. range 95% above 180°C. with decomposition. Visc. @ 20°C. 0.01777 Poise. F. P. 81°F. Available as a mixture of its various isomers. Uses: stench; flotation reagent. Sharples Solvents Corp.

1.2.5.6—DIBENZANTHRACENE—$C_{22}H_{14}$. M. P. 258-260°C. A synthetic product known to be one of the constituents of coal-tar. Used to promote cancerous growths on experimental animals. Eastman Kodak Co.

DIBUTYL ETHER—$C_4H_9OC_4H_9$. Water-white, chemically stable liq., mild, ethereal odor. Sp. gr. 0.769-0.772 @ 20/20°C. Dist. range 130-145°C. at least 90% between 138-145°C. F. P. 25°C. Misc. most common organic solvents. Water, dibutyl ether, mutually insol. and immiscible. Not solvent for nitrocellulose even in combination with alcohols. Uses: solvent ester gums, dammar gum, rosin, vegetable and essential oils, many chemical syntheses, also acetic, propionic, benzoic, salicylic, stearic acids; extractant or precipitant many purification processes. Commercial Solvents Corp.

DICETYL—Also known as n-Dotriacontane. $CH_3(CH_2)_{30}CH_3$. M. P. 68-69.5°C. A normal hydrocarbon consisting of 32 carbon atoms linked together in the form of a straight chain. Eastman Kodak Co.

DIETHANOLAMINE—$(CH_2CH_2OH)_2.NH$. Straw colored liq. Sp. gr. 1.090-1.100 @ 20/20°C. Wt. per gal. 9.141 lbs. @ 20°C. B. P. 217°C. @ 150 mm. M. P. 28°C. .01 N solution has pH of 8.88. Entirely sol. water; miscible most organic solvents. Uses: absorbent for acid gases; softening and moistening agent; synthesis organic compounds by esterification of the hydroxy groups of Diethanolamine or by its condensation with aldehydes. Carbide & Carbon Chemicals Corp.

DIMETHYLAMINE—$(CH_3)_2NH$. Gas, strong ammoniacal odor. Boils @ 7.2-7.3°C. @ 764 mm. mercury. Readily sol. water. Product of high purity supplied in water solution of 25-35% concen-

tration by wt. Highly reactive base; forms many interesting complexes with a variety of organic and inorganic substances of an acidic nature. Uses: tanning, rubber industries. Commercial Solvents Corp.

DIMETHYL PHTHALATE—$C_6H_4(COOCH_3)_2$. Water-white, pale, straw colored liq., slight odor, low volatility. Sp. gr. 1.185-1.205 @ 20/20°C. Dist. range 268-278°C. @ 760 mm. mercury. F. P. 132°C. Misc. most common organic solvents. Sol: cellulose acetate. High gelatinizing power for nitrocellulose. Uses: solvent acetone; plasticizer cellulose acetate lacquers and plastics, rubber mixtures. Commercial Solvents Corp.

a, a-DI NAPHTHOL CRYSTAL—$C_{20}H_{12}(OH)_2$. White cryst. powder. M. W. 286. M. P. 300°C. Very sol. alcohol, ether. Uses: intermediate dyes. American Chemical Products Co.

Di-o-CRESOL—4-4 Dihydroxy-3, 3-Dimethyldiphenyl. $C_{14}H_{14}O_2$. M. P. 157°C. M. W. 214. Very sol: alcohol, ether; insol: water. Uses: intermediate for dyes; coupling agent. American Chemical Products Co.

p-p-DIPHENOL—p-p-Dihydroxydiphenyl. $C_{12}H_{10}O_2$. Fine cryst. powder. M. P. 270°C. M. W. 186.08. Slightly sol. water; very sol: alcohol, ether. Uses: intermediate for dyes; coupling agent. American Chemical Products Co.

DIPROPYL KETONE—Butyrone. $(CH_3CH_2CH_2)_2CO$. Colorless liq. Sp. gr. .8162 @ 20/20°C. B. P. 143.4°C. Solubility in water 0.5% @ 20°C. Sol: alcohol, hydrocarbons, and most organic solvents. Uses: in lacquers as high boiling ketone; especially good solvent for Vinylite resins. Carbide & Carbon Chemicals Corp.

DOWICIDE A—Water soluble, practically odorless, non-toxic, phenol derivative. From .25% to .50% (dry basis) generally required to give satisfactory results. Uses: combatting various types bacteria and fungi; particularly as a preservative for adhesives such as hide, bone, fish and casein glues, for starch, dextrin and gum pastes. Dow Chemical Co.

DOWICIDE B—Water soluble, practically non-toxic, chlorinated, phenol derivative. Uses: effective against many types of fungi at concentrations below .005%; combatting various types of micro-organisms; particularly effective in preventing mold as well as putrefaction in animal glues where .10% to .20% (dry basis) gives satisfactory results. Dow Chemical Co.

DOWICIDE C—Water soluble, non-toxic, chlorinated, phenol derivative. Faint characteristic odor. Phenol coefficient of 97 against *Eberthella typhi* and 100 against *Staphylococcus aureus*. Uses: efficient germicide for disinfectant or antiseptic purposes; fortifying and increasing germicidal efficiency of other products; fungicide for wood preservation. Dow Chemical Co.

DOWICIDE D—Water soluble, non-toxic, chlorinated, phenol derivative, supplied in 40% aqueous solution. Relatively odorless and non-irritating. Phenol coefficient of 55 against *Eberthella typhi*, 100 against *Staphylococcus aureus*, and 125 against *Streptococcus hemolyticus*. Uses: effective against many different micro-organisms; as efficient germicide. Dow Chemical Co.

DOWICIDE E—Water soluble, non-toxic, brominated, phenol derivative, supplied in 40% aqueous solution. Relatively odorless and non-irritating. Phenol coefficient of 111 against *Eberthella typhi*, 80 against *Staphylococcus aureus*, and 110 against *Streptococcus hemolyticus*. Uses: efficient germicide against many different micro-organisms, particularly *Eberthella typhi*. Dow Chemical Co.

DOWICIDE I—Water insoluble, practically odorless, non-toxic, phenol derivative. Sol: organic liq. such as alcohol and acetone. Uses: as preservative or general germicide in combatting various types of bacteria and fungi. Dow Chemical Co.

DOWICIDE II—Water insoluble, chlorinated, phenol compound. Phenolic odor. Uses: preventing mold and mildew where a water insoluble material is desired; wood preservative with fungicidal coefficient of .007%; effective against many types of fungi; combatting various types of micro-organisms; preventing mold as well as putrefaction in animal glues. Dow Chemical Co.

DOWICIDE III—Water insoluble, non-toxic, chlorinated, phenol derivative. Faint, characteristic odor. Insol. water; sol. most organic liq. Phenol coefficient of 97 against *Eberthella typhi* and 100 against *Staphylococcus aureus*. Uses: efficient germicide for disinfectant or antiseptic purposes; fortifying and increasing germicidal efficiency of other products; fungicide for wood preservation. Dow Chemical Co.

DOWICIDE IV—Water insoluble, non-toxic, phenol derivative. Relatively odorless and non-irritating. Sol. most organic liq. such as alcohol, acetone, etc. Phenol coefficient of 55 against *Eberthella typhi*, 100 against *Staphylococcus aureus*, and 125 against *Streptococcus hemolyticus*. Dow Chemical Co.

DOWICIDE V—Water insoluble, non-toxic, phenol derivative. Relatively odorless and non-irritating. Sol. organic liq. such as alcohol, acetone, etc. Phenol coefficient of 111 against *Eberthella typhi*, 80 against *Staphylococcus aureus*, 110 against *Streptococcus hemolyticus*. Uses: germicide against many different micro-organisms. Dow Chemical Co.

DOWTHERM—Series of stable, colorless liq. known as Dowtherm A, B, C, & D for heat transfer and storage purposes. Sol. most organic solvents; practically insol. water. Uses: heat transfer work in power plant boilers, chemical processes, oil distillation, laboratory heating work, candy kitchens, linseed oil factories, and various process industries. Dow Chemical Co.

DRI-TEX—A pine oil base compound of high solvent power for use in the dry cleaning process. Does not stain or injure delicate textiles. The Hercules Powder Co., Inc.

DRY SIZE—Wood rosin paper size in form of a dry, porous, free-flowing powder. First dry size with full sizing efficiency. The Hercules Powder Co., Inc.

DUPRENE LATEX—An emulsion of polymerized chloroprene containing water and stabilizing agents. It can be spun into thread and fabricated in much the same way as natural rubber latex. One of its suggested uses is for impregnating porous materials to render them highly resistant to the action of oils, acids and solvents. E. I. du Pont de Nemours & Co., Inc.

DUPRENE PLASTIC POLYMER—A plastic polymer of chloroprene, which is the reaction product of monovinylacetylene and hydrochloric acid. It is useful for manufacturing super-aging rubber-like products that are highly resisting to the action of oils, solvents, acids and heat. E. I. du Pont de Nemours & Co., Inc.

DUTOX—A fluorine compound. A barium fluosilicate insecticide for agricultural use; and non-arsenical insecticide used to control beetles and leaf-eating insects that attack fruit, vegetables and flowers. The Grasselli Chemical Co.

ETHYL ACETATE—$CH_3COOC_2H_5$. Water-white, volatile liq., pleasant, fruity, non-residual odor. Sp. gr. 0.883-0.888 @ 20/20°C. Acidity not more than 0.2% as acetic acid. Dist. range 70-80°C. not more than 10% below 72°C. F. P. -5°C. 85-88% ester by wt. Misc. all proportions most common organic solvents. Dissolves nitrocellulose, camphor, many oils, fats, gums, resins, etc. Uses: solvent nitrocellulose lacquers, other types pyroxylin coatings; preparation medicinals, perfumes, flavors, many synth. products. Commercial Solvents Corp.

ETHYL CROTONATE—$CH_3CH:CHCOOC_2H_5$. Colorless liq., pleasant

odor. Sp. gr. 0.923 (15.6°C). B. P. 136-138°C. Misc. alcohol, ether, various other esters. Uses: general solvent. Niacet Chemicals Corp.

ETHYL ORTHO BENZOYL BENZOATE—$C_6H_5COC_6H_4COOC_2H_5$. White, cryst. solid; practically odorless, colorless, and non-volatile at ordinary temperatures. M. P. 56-58°C. B. P. 325°C. at 760 mm. Insol: water; very sol: most organic solvents, including alcohol, acetone, ethyl acetate, benzol. Uses: as plasticizer. The Calco Chemical Co., Inc.

EXTREME PRESSURE LUBRICANT BASE GD-152—A substance which, when blended at the rate of 1% or less with lubricating oil, imparts the property of sustaining gear loads double to quadruple that which the lubricating oil alone could carry without breaking down and causing equipment damage. This material functions by forming a film on the metal surface which is highly resistant to extreme pressures. E. I. du Pont de Nemours & Co., Inc.

EXTREME PRESSURE LUBRICANT BASE GD-162—Chlorine and sulfur compounds which have been developed for use as extreme pressure lubricant bases are deficient in that they often promote corrosion. This new base is non-corrosive, in fact inhibits corrosion, develops a film strength of over 65,000 lbs. per square inch and gives an extremely low torque. It is effective in concentrations of from 0.25% to 1%. E. I. du Pont de Nemours & Co., Inc.

FERRIC CHLORIDE—$FeCl_3$. A yellow, opaque, cryst. formation. Uses: mfr. glass, dyestuffs; in engraving; for water and sewage purification. Isco Chemical Co., subsidiary of Innis, Speiden & Co.

FERRISUL—Ferric Sulphate, Anhydrous. $Fe_2(SO_4)_3$. Granules or Powder. Sp. gr. .895. Sol: water. Decomposes on heating to high temperatures. Uses: water clarification, sewage treatment, paper sizing, mineral khaki colors, mfr. iron oxide pigments, printing textiles. Merrimac Chemical Co.

FLEXIBLE COATING RESINOID—Highly resistant to oils, common solvents, and mild acids and alkalies. Retains flexibility indefinitely. Fabrication: applied by calendering. Uses: as flexible fabric-coating material for exacting uses, most prominent of which is that of a waterproof back for surgeons' plaster. Bakelite Corp. (Developed in collaboration with Johnson & Johnson.)

FUMARIC ACID—COOH.CH:CH.COOH. Over 98% pure. M. P. 286°C. Sol: alcohol, ether, hot water. Non-toxic. Uses: germicide more powerful than phenol. American Cyanamid & Chemical Corp.

FUMARIC ACID—$C_4H_4O_4$. White powder. M. P. 286-287°C. Density 1.625 @ 18.5°C. M. W. 116. Sol: alcohol, ether; slightly sol: water. Uses: mfr. chemicals. National Aniline & Chemical Co., Inc.

GASOLINE ANTIOXIDANT No. 2—Highly efficacious for stabilizing cracked gasoline against discoloration, especially when subjected to direct sunlight. One pound of it will treat approximately 35,000 gallons of gasoline. It has no appreciable effect on gum formation but can be used in conjunction with gum inhibitors such as monobenzyl-para-aminophenol. E. I. du Pont de Nemours & Co., Inc.

GERANIUM #360—A product of brominated fluorescein, fugitive to sunlight. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

GERANIUM #1196—A product of anthranilic acid and beta naphthol disulphonic acid R. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

GLUTAMIRON—A complex iron glutamate in which the iron is mainly in the ferrous state. Light brown powder. Sol: water. Also marketed in form of chocolate covered tablets, each containing 350 mg. equivalent to 70 mg. of iron. Standard maximum dose: 4 tablets three times a day with meals, or about 900 mg. available iron per day. Uses: treatment secondary anemia. The Calco Chemical Co., Inc.

GREEN #3566—A product of Acid Green—fugitive. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

GREEN TONER #2038—A product of Malachite Green by patent process to insure permanency. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

GREEN TONER #2741—A product of Acid Green—fugitive. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

GREEN TONER #2937—A product of Malachite Green by patent process to insure permanency. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

GREEN TONER #3269—A product of Acid Green combination. Fairly permanent. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

HERCOLYN—A water-white, viscous liq. resin and plasticizer derived from the alcoholic esters of abietic acid. Adapted to nitrocellulose lacquers for coating papers and fabrics. The Hercules Powder Co., Inc.

H T H-15—A stable, intimate mixture of true calcium hypochlorite and sodium carbonate, containing not less than 15% available chlorine. In solution, calcium carbonate is precipitated, yielding sodium hypochlorite solution with a predetermined excess of carbonate alkalinity. Uses: germicide and disinfectant for use on food equipment; general sanitation; H T H-15 solutions combine high germicidal speed with low corrosion factor. The Mathieson Alkali Works, Inc.

HYBREX—A mixture of pine oil compounds. Uses: as paint for application to apple trees in the dormant season to kill overwintering codling moth larvae. The Hercules Powder Co., Inc.

HYDROXYLAMINE HYDROCHLORIDE C.P.—$NH_2OH.HCl$. White dry cryst. M. W. 69.50. M. P. 151°C. Very sol. water; sol. alcohol; insol. ether. Uses: precipitating metals, strong reducing agent, powerful antiseptic, bleaching, printing and dyeing, color discharge, photographic developer, organic synthesis analysis, oxidation inhibitor fatty acids. American Chemical Products Co.

HYDROXYLAMINE SULPHATE SOLUTION Tech.—$(NH_2OH)_2SO_4$. M. W. 164.14. Colorless liq. Uses: strong reducing agent, precipitating metals, powerful antiseptic, bleaching, printing and dyeing, color discharge, photographic developer, oxidation inhibitor fatty acids. American Chemical Products Co.

IMPACT MOLDING MATERIALS—Series of molding materials which in impact strengths and molding qualities bridge the gap between the wood flour-filled materials, with their relatively low impact strengths and good molding qualities, and the laminating materials, with their high impact strengths and limited molding possibilities. Fabrication: by hot-molding in steel dies. Uses: as material of molded objects that must withstand rough handling. Bakelite Corp.

INDIUM—In. White, lustrous metal, very soft and ductile, slightly heavier than zinc. Does not tarnish appreciably in air or ordinary temperatures. Oxidizes readily above its melting point, burning with a brilliant violet flame at higher temperatures. Uses: at present largely for experimental purposes. The Grasselli Chemical Co. (First to produce Indium commercially.)

INHIBITOR—A synthetic organic product, added to acid solutions to prevent attack on iron and steel during process of scale removal by acid attack. Chief use: pickling of iron and steel. The Grasselli Chemical Co.

ISO-BUTYRAMIDE—$(CH_3)_2CHCONH_2$. M. P. 123-124°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

ISO-DURENE—$C_6H_2(CH_3)_4$. M. P. -26 to -24°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

ISOPROPYL ACETATE—$CH_3.COO.CH(CH_3)_2$. Water-white liq. containing not less than 95% ester by weight. Sp. gr. .870 to .875 @ 20/20°C. Boiling range 86-90°C. Wt. per gal. 7.271 lbs. @ 20°C. Miscible all proportions with gasoline (60°Bé.); completely miscible with the commonly used organic solvents; sol. water to extent of 4.5% @ 27°C. Uses: mfr. nitrocellulose lacquers and dopes, pyroxylin plastics, waterproof cements, thinners, organic chemicals. Carbide and Carbon Chemicals Corp.

ISOQUINOLINE—C_9H_7N. Colorless liq. or solid. Sp. gr. 1.090 (30°C.). M. W. 129.06 Freezing Point 25.3°C. B. P. 243°C. Refractive Index 1.62233 (25.1°C.). Uses: mfr. pharmaceuticals. The Barrett Co.

IZEN—Water soluble. Product formulated especially for bulk users and may be combined with the finishing process at nominal cost. Does not change appearance or feel of a fabric and renders it shower-proof, perspiration and spot-proof. Fabrics treated in this way may be laundered and still remain impervious to water or stains. Uses: for mfrs. of silks, rayons, woolens and cottons. Prior Laboratories, Inc., Selling Agents.

IZEN—A waterproofing and spot-proofing medium for treating hose, hats, ties, draperies, suede shoes, curtains and all delicate dress goods. Water-white, non-inflammable. Will not injure the most delicate skin or finest fabrics, dries quickly, and is absolutely odorless after treatment. To Izen-ize, merely saturate and allow to dry. Prior Laboratories, Inc., Selling Agents.

LIGNASAN—Freshly sawn lumber is susceptible during the seasoning period to discoloring sap stains caused by fungous organisms. Lumber dipped in a 1 to 400 solution of Lignasan in water generally seasons clean and bright, therefore possesses a higher market value. Lignasan contains 5% of a powerful organic mercurial as its principal toxic ingredient. E. I. du Pont de Nemours & Co., Inc.

MABELITE PIGMENT—An intimate, reddish-brown mixture, produced by nature, of fine argillaceous hematite, cryst. silica and alumina. Sp. gr. 3.01. Covering power 500 sq. ft. (or more) per gal. Oil absorption 27. One lb. of dry pigment bulks .038725 gals. Non-fading, non-poisonous, non-bleeding, light-proof, acid-resisting, alkali-proof, heat resisting, rust inhibiting, dielectric. Uses: mfr. protective paints and similar products where exceptional resistance to destructive agencies is required. American Cyanamid & Chemical Corp.

MAGNEPHEN—A new and improved cinchophen designed to furnish grain for grain equivalent to the usual 7½ grain tablet of cinchophen. Is the magnesium salt of phenylcinchoninic acid potentiated by the magnesium ion. A white powder sold in the form of tablets and particularly suitable for arthritis, rheumatic fever, etc. The Calco Chemical Co., Inc.

MAGNEPYRINE—A new and improved amidopyrine which has been potentiated by magnesium. White powder sold in form of tablets. Uses: for severe painful conditions such as neuralgia, rheumatism, arthritis, dysmenorrhea, etc. The Calco Chemical Co., Inc.

MAGNESPIRIN—A new and improved acetyl salicylic acid designed to furnish grain for grain equivalent to the usual 5-grain tablet of aspirin, but employing a much smaller amount of the latter drug, due to the potentiating effect of the magnesium ion. Sold in form of tablets, and prescribed wherever aspirin would be employed. Has advantage of better toleration. The Calco Chemical Co., Inc.

MALEIC ACID—COOH.CH:CH.COOH. Solid fused mass. Over 98% pure. M. P. about 136°C. Sol: water, alcohol, ether. Uses: mfr. resins, certain intermediates; dyeing and printing textiles. American Cyanamid & Chemical Corp.

MALEIC (TOXILIC) ACID—$C_4H_4O_4$. White Powder. M. P. 130°-131°C. Density 1.50 at 18.5°C. M. W. 116. Sol: water, alcohol, ether. Uses: mfr. synthetic resins, chemicals, rancidity inhibitor for oils. National Aniline & Chemical Co., Inc.

MALEIC ANHYDRIDE—$C_4H_2O_3$. Small white needle cryst. Over 98% pure. M. P. about 60°C. Uses: mfr. synthetic resins, certain intermediates for dyes. American Cyanamid & Chemical Corp.

MALEIC (TOXILIC) ANHYDRIDE—$C_4H_2O_3$. Nearly white fused product. M. P. 52.6°C. Density 1.42 @ 28°C. M. W. 98. Sol: benzene hydrocarbons, acetone, ethyl ether, chloroform. Uses: mfr. synthetic resins, chemicals. National Aniline & Chemical Co., Inc.

MALIC ACID—$C_4H_6O_5$. White Powder. M. P. 129°C. Density 1.60 @ 15°C. M. W. 134. Sol: water, alcohol, ether. Uses: food acidulant; mfr. chemicals, pharmaceuticals. National Aniline & Chemical Co., Inc.

MANGANAR—A manganese arsenate insecticide for agricultural use. Its principal advantage is due to the fact that it contains no lead. It is, therefore, easy to remove the spray residues from apples, and for that reason has an advantage over insecticides containing lead. The Grasselli Chemical Co.

MANGANAR ROSE DUST—A formulated inorganic insecticide-fungicide for garden use, recommended and used to treat fungus diseases, such as black spot, brown canker and mildew, and controls most leaf-eating insects that attack flowers. The Grasselli Chemical Co.

MARINE WEED KILLER AND FISH NET PRESERVATIVE—American fishermen have annually suffered a damage of $7,000,000 to nearly $14,000,000 to their nets and gear because of marine weed, bacterial and insect ravages. This Marine Weed Killer and Fish Net Preservative was developed in cooperation with the U. S. Bureau of Fisheries. Tests have proved that it should eliminate a large part of the loss to the fishing industries. E. I. du Pont de Nemours & Co., Inc.

MAROON B—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

MAROON TONER #754—A product of Tobias Acid and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

MAROON TONER #3274—A product of Tobias Acid and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

METHYL ACETATE—$CH_3.COO.CH_3$. Available in two concentrations—82% and 99% by wt. Both water-white liq. 82%: Sp. gr. .905-.910 @ 20/20°C., boiling range 53°-56°C., wt. per gal. 7.552 lbs. @ 20°C. 99%: Sp. gr. .930-.940 @ 20/20°C., boiling range 55°-58°C.,

wt. per gal. 7.779 lbs. @ 20°C. Both miscible all proportions with 60°Bé. gasoline, also alcohol, ether, and most organic solvents; slightly sol. water. Uses: solvent cellulose acetate and nitrate; mfr. artificial leather, plastics, dyestuffs, synthetic perfumes, flavoring extracts; general solvent. Carbide and Carbon Chemicals Corp.

METHYL ACETATE—$CH_3COO.CH_3$. Colorless liq., fragrant, apple-like odor. Sp. gr. 0.939 (15.6°C). M. P. 98°C. B. P. 57°C. Sol: alcohol, ether; sparingly sol: water. Uses: solvent in cellulose ester varnishes and lacquers, nitrocellulose plastics, cosmetics, perfumes, extracts, artificial leather, synthetic dyestuffs, rubber cements. Niacet Chemicals Corp.

METHYL-p-AMINOBENZOATE—$C_6H_4NH_2COOCH_3$. M. P. 111-112°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

METHYL AMYL ACETATE—Methyl Isobutyl Carbinol Acetate. $(CH_3)_2$ $CHCH_2CHOH_3OCOCH_3$. Water white liq. Solubility in water 0.8% @ 20°C. Sol: alcohols, hydrocarbons, most organic liq. Sp. gr. .853-.859 @ 20/20°C. Boiling range 139°-147°C. Acidity less than .02% cal. as acetic. Ester content 88-92%. Flash Point 45°C. Uses: high-boiling lacquer solvent; excellent "blush register". Carbide & Carbon Chemicals Corp.

METHYL AMYL ALCOHOL—Methyl Isobutyl Carbinol. $(CH_3)_2$ $CHCH_2CHOHCH_3$. Water-white liq. Sol: alcohol, hydrocarbons, most organic liq. Solubility in water 1.73% @ 20°C. Sp. gr. .804-.810 @ 20/20°C. Boiling range 128°-131°C. Acidity no more than .05% calc. as acetic acid. Flash Point 46°C. Uses: mfr. lacquers; mutual solvent; preparation synthetic resins. Carbide & Carbon Chemicals Corp.

METHYL ISOBUTYL KETONE (HEXONE). $(CH_3)_2CHOH_2COCH_3$. Water-white liq. Sp. gr. .798-.804 @ 20/20°C. Boiling range 115°-122°C. Acidity not more than .05% calc. as acetic acid. Wt. per gal. 6.6 lbs. Solubility in water 87% @ 20°C. Sol: acetone, alcohol, ether, hydrocarbons, and most organic liq. Flash Point 23°C. Red label. Uses: in lacquers as "medium-boiling" solvent; solvent for cellulose nitrate and resins. Carbide & Carbon Chemicals Corp.

METSO—Sodium Metasilicate. Na_2 $SiO_3.5H_2O$. White cryst. Purest form of metasilicate. Free flowing. Easily sol. water. Produces solutions of higher pH than other alkalies except corrosive caustic soda. Silica content furnishes inhibiting properties. Uses: cleansing agent various processes, *e. g.*, laundries, bottling plants, dairies, machine shops, textile mills, packing houses; as new basic alkali. Philadelphia Quartz Co.

MID-CONTINENT REFINED OIL—Having Fluorescent Aspect to Match Pennsylvania Type.—By a chemical process it is now possible to impart to refined lubricating oils, made from Mid-Continent crude petroleum, a bloom and fluorescence which very closely approximates these aspects that are generally inherent in oils obtained from Pennsylvania sources. E. I. du Pont de Nemours & Co., Inc.

1800 MOLDING POWDER—Very intimate mixture of a phenol-formaldehyde thermosetting resin, wood flour and dye. Under pressure at elevated temperatures softens and flows to take the shape and polish of all types of molds. Sp. gr. 1.36. Transverse strength 12,000 lbs. per sq. in. Bulk factor 9 grams per cu. in. Uses: mfr. bottle closures, electrical fixtures, distributor heads, cosmetic containers, knobs, handles, ash trays, tumblers, telephones, buttons, etc. Resinox Corp.

MONOAMYLAMINE—$C_5H_{11}NH_2$. Sp. gr. 0.7761 (20°C.). M. W. 87. Dist. range 85-106°C. Visc. @ 20°C. 0.01018 Poise. F. P. 45°F. Molar aqueous solution has pH 11.67. This is significant in comparing with a molar solution of ammonium hydroxide having pH 11.62. Contains amyl group in its various isomeric forms. Reacts rapidly with most acids to form salts and soaps. When reacted with high molecular acids, such as Oleic or Stearic, product is misc. with various other organic liq. Solutions produce stable emulsions with water. Uses: textile industry as lubricants; leather finish; in polishes, paper sizes; solvent many organic compounds. Sharples Solvents Corp.

MONOBENZYL-PARA-AMINO-PHENOL—An antioxidant for treating cracked gasoline to inhibit the formation of gum, stabilize against discoloration and prevent the material loss of initial anti-knock value. It is effective in gasoline at the rate of only 5 to 25 parts per million. In other words, 1 lb. of monobenzyl-para-aminophenol will stabilize on the average approximately 100,000 gallons of cracked gasoline. E. I. du Pont de Nemours & Co., Inc.

MONOETHANOLAMINE—$(CH_2.CH_2OH).NH_2$. Water-white liq. Sp. gr. 1.017-1.027 @ 20/20°C., not less than 90% distilling between 165°-173°C. Wt. per gal. 8.472 lbs. @ 20°C. Completely sol: water, alcohol, most organic solvents. 1% solution has pH of 11.5. Uses: mfr. dyestuffs, pharmaceuticals, textile compounds, electrolytic condensers, dry cleaning soaps, soluble oils; acid gas absorbent; preparation cosmetic creams, polishes, oil, wax, and solvent emulsions; removal carbon from aluminum pistons of airplane motors; dispersing agent for casein and shellac; penetrant, softening and moistening agent. Carbide & Carbon Chemicals Corp.

MONOMETHYLAMINE —CH_3N H_2. Inflam. gas, strong ammoniacal odor. Boils @ -6°C. to -5.5°C. @ 768 mm. mercury. One vol. water @ 25°C. dissolves 959 vols. monomethylamine. Highly reactive base. Product of high purity supplied in water solution of 25-30% concentration by wt. Uses: depilatory tanning industry; mfr. dyes, chemical compounds; in liq. form good solvent for many organic compounds. Commercial Solvents Corp.

NAVY BLUE NTS PASTE—A new fast to light, chlorine, and washing, Vat Navy Blue for the dyeing and printing of cotton and silk. Its outstanding quality is its extreme fastness to water spotting. Also has excellent levelling qualities, and provides an unexcelled base for all shades of Navy Blue. The Calco Chemical Co., Inc.

NIGHT BLUE #1873—A product of Patent Blue—fugitive. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

NITRATE OF SODA—Guaranteed analysis 98.6% $NaNO_3$, actually tests about 99.5%. These larger granules (round-cornered and solid) have been developed to improve the mechanical condition of this product and to make it easy to apply when used as a fertilizer. Made by Atmospheric Nitrogen Corp., for The Barrett Co.

NITRATE OF SODA—Special Fine Crystal Grade. Guaranteed analysis 98.6% $NaNO_3$, actually tests about 99.5%. This grade has been developed expressly for use in connection with meat curing, ceramics, certain types of explosives, and various special chemical requirements. Made by Atmospheric Nitrogen Corp., for The Barrett Co.

3-NITROACENAPHTHENE—$(CH_2)_2$ $C_{10}H_5NO_2$. M. P. 100-102°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

p-NITROBENZHYDRAZIDE—NO_2 $C_6H_4CONHNH_2$. M. P. 210-211°C. Uses: laboratory reagent; chemical syntheses. Eastman Kodak Company.

OIL-SOLUBLE VARNISH RESIN, 100% PHENOLIC—Has degree of oil-solubility that gives clear varnishes without necessity of settling or filtering. Gives light colored varnish that shows little or

no after-yellowing. In strength, hardness, flexibility, water-, acid-, alkali-, and light-resistance, and in quick drying characteristics is the equal of the darker oil-soluble phenolic resins. Fabrication: by use of regular varnish manufacturing equipment. Uses: with drying oils as the resin ingredient of paints, varnishes, enamels. Bakelite Corp.

OLIVE BROWN G—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

ORANGE 4R—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

ORANGE TONER #3567—A product of O-chloro-M-toluidine-P-sulphonic acid and beta naphthol. Quite permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

ORANGE YS—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

ORCHID #2093—A product of anthraquinone derivative. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

ORTHO SILICATE OF SODA—$2Na_2O.1SiO_2$. A readily soluble salt. Due to high sodium oxide content solutions retain efficiency until virtual exhaustion. Uses: as builder of special types of soaps; washing textiles; cleaning glassware and metals. Mechling Bros. Chemical Co.

PARACOL—A water dispersible emulsion of colloidal wax developed to aid the sizing and coating of paper. The Hercules Powder Co., Inc.

PEACOCK BLUE #2179—A product of tetramethyl-diamino-O-chlorotri phenylcarbinol anhydride by patent process to insure permanency. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

PEARLPARA—Paradichlorobenzene. Weight. 47 lbs./cu. ft. M. P. 53.1°C. B. P. 174°C. Vapor Pressure at 30°C: 1.5-2 mm. mercury. By producing it in form of beads or pearls, it does not cake and is very easy and convenient to handle, *e. g.*, in shaker cans. Uses: household moth killer and preventative. Niagara Alkali Co.

PENTAPHEN—Para Tertiary Amyl Phenol. $C_5H_{11}C_6H_4OH$. Sp. gr. 0.91-0.94 (95°C.). M. W. 164. Softening Point not less than 80°C. Final Melting Point not less than 88°C. Distillation 95% bet. 250-265°C. Solubility: sol. 10% aqueous KOH. F. P. 256°F. Insol. water; readily sol. most organic solvents. Impurities: non-volatile matter, not over 0.001%. Free Phenol, less than 0.1%. Very small amounts of amyl phenyl ethers and secondary amyl phenol. Uses: mfr. oil soluble varnish resins of phenol-formaldehyde type. Sharples Solvents Corp.

PETREX—A synthetic resin base for the production of varnish materials developed from interaction of terpinene and malainic anhydride. The Hercules Powder Co., Inc.

PHENOLIC DENTURE RESINOID—Molding resinoid free-flowing under initial heat of molding. When molded is hard, strong and rigid at body temperature. Adheres strongly to porcelain or metal of a denture; is resistant to mouth secretions; very low in water absorption, all conducive to comfort and dental hygiene. Fabrication: hot molding in prepared plaster flasks, as in regular dental practice. Uses: all types dental plates. Bakelite Corp.

PHENYL MERCURY NITRATE—$C_6H_5HgNO_3$. M. P. approx. 180°C. dec. A new mercury antiseptic effective as a bactericide and fungicide, yet apparently non-toxic to animals or animal tissues. Eastman Kodak Co.

PHENYLHYDRAZINE HYDROCHLORIDE, C. P.—$C_6H_5NH.NH_2HCL$. White, silky, dry cryst. M. W. 144.58 M. P. 240°C. Very sol. alcohol, water. Uses: medicinal, photographic. American Chemical Products Co.

P H-Plus—Fused soda ash cast in one-half lb. cakes, purified to meet requirements of water treatment, particularly pH control. Slow and uniform rate of solution permits close regulation of pH or alkalinity when used in soda pots or other chemical feeders. Uses: for swimming pools, industrial filtration and processing—water treatment, miscellaneous deacidifying and water softening purposes. The Mathieson Alkali Works, Inc.

PHTHALIC ANHYDRIDE (ODORLESS)—$C_8H_4O_3$. White cryst., odorless flake. M. P. 130.84°C. Density 1.527 @ 4°C. Sol: alcohol, ether; slightly sol. water. Uses: mfr. synthetic resins, solvents, plasticizers, chemicals, pharmaceuticals. National Aniline & Chemical Co., Inc.

PHTHALIMIDE—$C_6H_4:(CO)_2:NH$. White plate cryst., over 98% pure. M. P. 233.5°C. Uses: mfr. anthranilic acid, certain colors. American Cyanamid & Chemical Corp.

PIGMENT 10720—A phospho-tungstic acid color of extreme concentration. Used to some extent by the lacquer industries and quite freely by printing ink manufacturers. Paul Uhlich & Co.

PIGMENT BLUE 4721—Used mostly in printing inks; also finding favor in mfr. of various plastic moldings, although it is not classed as a permanent color. Paul Uhlich & Co.

PIGMENT GREEN 1315—A Malachite Green type of lake; not fast to light, but used in printing inks where its fugitive tendencies are not important. Paul Uhlich & Co.

PIGMENT ORANGE 3900—Sometimes known as a Permaton type of color. Suitable for paints, printing inks, lacquers, and some forms of plastic moldings. Paul Uhlich & Co.

PIGMENT YELLOW 4—A toluidine yellow of Hansa type, suitable for practically every color consuming industry. Paul Uhlich & Co.

PLANT SPRAY #2—Combination insecticide and fungicide developed especially for treating citrus, such as grapefruit, oranges, tangerines and lemons to control Scale Insects and White Fly, as well as certain fungus diseases such as Melanose and Scab. It usually causes a more abundant and healthier production of foliage, twigs and fruit. One of its active ingredients is a powerful organic mercurial. E. I. du Pont de Nemours & Co., Inc.

PLASTIC BLUE #3034—A product of dianisidine and aminonaphthol disulphonic acid—fugitive. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

POTASH MANURE SALTS—Sylvinite—Crude Potassium Chloride. 25-26% K_2O. Uses: fertilizers. United States Potash Co., Inc.

POTASSIUM 3-NITROPHTHALIMIDE—$C_8H_3O_4N_2K$. A derivative of phthalic anhydride which reacts with organic halides to form crystalline compounds with definite melting points, by

means of which organic halogen derivatives may be identified. Eastman Kodak Co.

POTASSIUM SILICATE GLASS—$K_2O3.8SiO_2$. Supplied as broken glass. Today is finding new specialized application and should prove of considerable use as an ingredient of coal glazes, where in the past sodium silicate has been used and where potassium silicate, due to its comparative freedom from all efflorescence, should be better adapted to the purpose. The Grasselli Chemical Co.

POTASSIUM SILICATE SOLUTION 30°—$K_2O3.8SiO_2$. Today finding new specialized application; and will probably find its greatest use as an inorganic base for paint, where its relative freedom from efflorescence and insolubility make it superior to silicate of soda. Useful as a filler in potash soaps and as an ingredient of welding rod coating, resulting in improvement of physical properties of the coating. The Grasselli Chemical Co.

PROPENYL GUAETHOL—$C_{11}H_{13}O_2$. Grayish white cryst. M. P. 86-88°C. Uses: anti-oxidant in fats and oils. Used at rate of 0.1 of 1% (1 lb. to 1000 lb.) of fat or oil, has marked effect in retarding the auto-oxidation and accompanying rancidity of oils and fats. R. W. Greeff & Co., Inc.

PROPYLENE CHLORHYDRIN—$CH_3.CHOH.CH_2Cl$. Colorless liq., faint ethereal odor. Azeotropic water mixture approximately 51% concentration. Sp. gr. 1.08 (20°C.). B. P. 127°C. Wt. per gal. approximately 9 lbs. Uses: organic synthesis for the introduction of the hydroxy-propyl group. Carbide & Carbon Chemicals Corp.

PROPYLENE DICHLORIDE—$CH_3.CHCl.CH_2Cl$. Colorless liq. Sp. gr. 1.16 (15°C.). B. P. 96.8°C. Wt. per gal. 9.6 lbs. (20°C). Insol: water. Uses: solvent for oils, fats, waxes, gums, resins; liq. soap, cleaning and scouring compounds; spot removing compounds; extraction; reagent organic synthesis. Carbide & Carbon Chemicals Corp.

PROPYLENE GLYCOL—$CH_3.CHOH.CH_2OH$. Colorless liq., practically odorless. Sp. gr. 1.03 (20°C.). B. P. 188°C. Wt. per gal. 8.64 lbs. (20°C.). Completely sol: water. Uses: solvent; moistening agent; mfr. cosmetics, perfumes, flavoring extracts, pharmaceuticals; reagent organic synthesis, having two replaceable hydroxyl groups. Carbide & Carbon Chemicals Corp.

PROPYLENE OXIDE—$CH_3.CH.CH_2.O$. Colorless liq. Sp. gr. 0.86 (15°C.). B. P. 35°C. Wt. per gal. 6.9 lbs. (20°C.). Sol: water and usual organic solvents. Uses: solvent nitrocellulose, cellulose acetate, gums, resins; mfr. quick drying cements; mold inhibitor; reagent in organic synthesis. Carbide & Carbon Chemicals Corp.

PURPLE TONER #3571—A product of methyl violet by patent process to insure permanency. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

PYRIDINE—C_5H_5N. Colorless liq. Sp. gr. 0.988 (15.5°C.). M. W. 79.05. Freezing Point -40°C. B. P. 115.5°C. Refractive index 1.50919. Completely sol. water. Forms constant boiling mixture with 42% water, boiling @ 93.0°C. @ 760 mm. Industrial product—boiling range not over 2°C. Uses: mfr. piperdine, derivatives, medicinals. The Barrett Co.

PYROTE—A combination of Pyrethrum and Rotenone with a neutral soap spreader, which form a double acting, non-poisonous, concentrated insect spray for flowers, fruits, vegetables and plants. Mechling Bros. Chemical Company.

QUINOLINE—C_9H_7N. Colorless liq. (industrially pure grades yellowish). Sp. gr. 1.095 (15.5°C.). M. W. 129.06. Freezing Point 22.6°C. B. P. 237.2°C. Refractive Index 1.62450 (24.9°C.). Solubility in water 0.2% (30°C.). Solubility of water in quinoline 17% (30°C.). Industrial product—boiling range not over 2°C. Uses: mfr. 8-hydroxyquinoline and derivatives. The Barrett Co.

RED BROWN R—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

RED TONER #18—A product of O-chloro-M-toluidine-P-sulphonic acid and beta naphthol. Quite permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #203—A product of Tobias Acid and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #1540—A product of paranitraniline and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #1609—A product of metanitroparatoluidine and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #1795—A product of Tobias Acid and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #2010—A product of P-toluidine-M-sulphonic acid and hydro-oxy naphthoic acid. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #2074-A product of P-toluidine-M-sulphonic acid and hydro-oxy naphthoic acid. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #3179—A product of chlorinated paranitraniline and beta naphthol. Very permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER #3289—A product of anthranilic acid and beta naphthol. Quite permanent. Uses: dry color lake for plastic and rubber industries. Brooklyn Color Works, Inc.

RED TONER 8000—A pure toluidine toner suitable for practically every color consuming industry. Extremely opaque and very permanent under all weather conditions. Paul Uhlich & Co.

RED TONER 9390—A red for Lake C type of pure color. Adaptable all types printing inks; suitable certain types coatings and solid moldings. Paul Uhlich & Co.

RED Y—An exceptionally bright red with non-subliming properties prepared especially for the rotogravure ink trade. It surpasses any of the other colors on the market in the aforementioned respect, and is regarded very highly by the manufacturers of inks for rotogravure work. The Calco Chemical Co., Inc.

REFINED MURIATE OF POTASH—Potassium Chloride, KCl 98-99.5% pure —62-62.8% K_2O. Uses: fertilizer; mfr. chemicals. United States Potash Co., Inc.

REFINED OIL FROM MID-CONTINENT CRUDE PETROLEUM—Lubricating oils mfrd. from Mid-Continent crude petroleum do not generally possess the same characteristic bloom and fluorescence as do those derived from Pennsylvania type crudes. This bloom and fluorescence can, however, be imparted by chemical means. E. I. du Pont de Nemours & Co., Inc.

REFINED OIL FROM PENNSYLVANIA CRUDE PETROLEUM—Refined lubricating oils manufactured from Pennsylvania crude petroleum possess a bloom and fluorescence which consumers

have become accustomed to regard as a criterion of fine quality. Oils derived from many other domestic sources seldom show this characteristic. E. I. du Pont de Nemours & Co., Inc.

827 RESIN COMPOUND—Phenol-formaldehyde condensation product compounded with lubricants and hexamethylenetetramine. Sp. gr. 1.29. M. P. 80°C. Uses: mfr. molding powders. Resinox Corp.

RESIN (SYNTHETIC) DYES—A complete line of coal tar dyes specially mfrd. for plastic compounds. National Aniline & Chemical Co., Inc.

RESINOID-FILLED PAPER AND BOARD—Materials of the laminating type prepared from pulp and resinoid in the process of making paper or board. Fabrication: by hot-pressing. Uses: for panelling or other simple forms. Bakelite Corp.

REZYL 280-1—A hard, alkyd resin made from phthalic anhydride. Uses: in coatings, impregnating compounds, adhesives. American Cyanamid & Chemical Corp.

REZYL 337-2—A liquid alkyd resin made from succinic acid. Uses: plasticizer for cellulose acetate. American Cyanamid & Chemical Corp.

REZYL 1103—A liquid oxidizing type alkyd resin, made from phthalic anhydride. Uses: in air drying; baking enamels and paints. American Cyanamid & Chemical Corp.

SANTICIZER B-16—A phthalyl glycollate plasticizer. $C_6H_4(COOC_4H_9)COOCH_2COOC_4H_9$. Very high-boiling; stable to light, acids and alkalies. Non-toxic. Uses: solvent-plasticizer for cellulose nitrate; also valuable as resin plasticizer. Monsanto Chemical Co.

SANTICIZER E-15—A phthalyl glycollate plasticizer. $C_6H_4(COOC_2H_5).COOCH_2COOC_2H_5$. High-boiling, light-stable, non-toxic. Uses: solvent-plasticizer for cellulose acetate and nitrate; also valuable as resin plasticizer. Monsanto Chemical Co.

SANTICIZER M-17—A phthalyl glycollate plasticizer. $C_6H_4(COOCH_3).COOCH_2COOC_2H_5$. High-boiling, light-stable, non-toxic. Uses: solvent-plasticizer for cellulose acetate; also valuable as resin plasticizer. Monsanto Chemical Co.

S-D-O-CORROSIVE RESISTING COATING—A polymer of divinylacetylene dissolved in solvent naphtha and is made synthetically from acetylene. Useful for protecting metals, concrete and wood against the corrosive action of acids, alkalies, solvents and other deteriorating influences. E. I. du Pont de Nemours & Co. Inc.

SEBACIC ACID—Dibasic 10-C Fatty Acid. $COOH.(CH_2)_8.COOH$. M. W. 202.14. Odorless, tasteless, white to cream color cryst. M. P. 127 to 131°C. Insol. water; sol. alcohol, ether, organic liq. Uses: mfr. resins, cosmetics, pharmaceuticals, high boiling esters, high power solvents for nitrocellulose; polymerizes readily to form adhesive, tough, elastic resins. American Chemical Products Co.

SHEETED CHEMICAL COTTON—A purified cotton cellulose made into sheeted form to fit the viscose rayon process. The Hercules Powder Co., Inc.

SODIUM ALUMINATE—White Soluble. $Na_2Al_2O_4$. White granules or powder. Sp. gr. .75. Sol: water. Uses: paper sizing, manufacture of color lakes, water clarification, water softening, boiler compounds. Merrimac Chemical Co.

SOFOS—A fused combination of sodium phosphates and sodium carbonate, cast from the molten salts into anhydrous briquets. Developed specifically for use as a detergent in mechanical dishwashing machines. Inserted in a container which regulates the flow of water, it dissolves at a uniform rate to maintain the optimum cleanser concentration during the wash period. The Mathieson Alkali Works, Inc.

SOLVENOL—A terpene derivative allied to turpentine, but having destructive solvent powers, for resins, rubber, etc. The Hercules Powder Co., Inc.

SUCCINIC ACID—$COOH.(CH_2)_2.COOH$. Pure white cryst., over 98% pure. M. P. 184°C. Uses: mfr. synthetic resins; in perfume esters, medicine; as anti-spasmodic agents, etc. American Cyanamid & Chemical Corp.

SUCCINIC ACID—$C_4H_6O_4$. White cryst. powder. M. P. 185°C. Density 1.564 @ 15°C. M. W. 118. Slightly sol: water, alcohol, ether. Uses: mfr. synthetic resins, chemicals, solvents, pharmaceuticals. National Aniline & Chemical Co., Inc.

SUCCINIC ANHYDRIDE—$C_4H_4O_3$. Nearly white lumps. M. P. 119.6°C. Density 1.104 @ 20°C. M. W. 100. Sol: alcohol, ether; insol: water. Uses: mfr. synthetic resins, chemicals, pharmaceuticals. National Aniline & Chemical Co., Inc.

SYNTHETIC BUTYL ACETATE—Normal Butyl Acetate. $CH_3.COO.C_4H_9$. Water-white liq. Sp. gr. .872-.877 @ 20/20°C. Wt. per gal. 7.290 lbs. (20°C.). Boiling range 115°-130°C. Ester content 88-92% by wt. Miscible all proportions with 60°Bé gasoline and the commonly used organic solvents and diluents. Sol: water to extent .5% @ 25°C. Uses: mfr. nitrocellulose lacquers, thinners, leather and paper coatings, pyroxylin plastics, safety glass, synthetic flavoring extracts and perfumes; solvent for gums and resins. Carbide & Carbon Chemicals Corp.

SYNTHETIC BUTYL ALCOHOL—Normal Butyl Alcohol. $CH_3.CH_2.CH_2CH_2OH$. Water-white liq. Sp. gr. .810-.813 @ 20/20°C. Boiling range 115°-118°C. Sol: most organic solvents, and water up to 8% by wt. at room temperature. Uses: mfr. esters, butyric acid and other butyl derivatives, dyestuffs, and color bases; formulation nitrocellulose lacquers, thinners, leather coatings, varnishes, pyroxylin plastics, photographic film; solvent for shellac, gums, oils; mutual solvent; anti-foaming and dehydrating agent. Carbide & Carbon Chemicals Corp.

SYNTHETIC BUTYRALDEHYDE—Normal Butyraldehyde. $CH_3.CH_2.CH_2.CHO$. Water-white liq. having purity of not less than 96% Butyraldehyde. Sp. gr. .813-.817 @ 20/20°C. Wt. per gal. 6.772 lbs. (20°C.). Boiling range 65°-78°C. Miscible water, alcohol, ether, and most organic solvents. Uses: mfr. rubber accelerators, anti-oxidants, butyric acid, organic chemicals, synthetic perfumes, resins. Carbide & Carbon Chemicals Corp.

SYNTHETIC BUTYRIC ACID—Butyric Acid. $CH_3.CH_2.CH_2.COOH$. Colorless liq. not less than 98% butyric acid content. Sp. gr. 0.9579 @ 20/20°C. Wt. per gal. 8.0 lbs. B. P. 163.5°C. Sol: water, most organic liq. Uses: mfr. cellulose esters, butyrates, flavors, ketones. Carbide & Carbon Chemicals Corp.

SYNTHETIC ETHYL ACETO ACETATE—Acetoacetic ester. $CH_3.CO.CH_2.COOC_2H_5$. Colorless liq. containing not less than 97.5% by wt. of ester. Sp. gr. 1.022-1.027 @ 20/20°C. Wt. per gal. 8.56 lbs. (20°C.). Boiling range 96-110°C. Completely miscible with ethyl alcohol, ethyl ether, ethyl acetate. Uses: intermediate in preparation dyestuffs, and as the pyrazolone colors (Hansa), and pharmaceuticals such as "anti-pyrine". Carbide & Carbon Chemicals Corp.

TANAK—A synthetic tanning material recommended as a bleach in conjunction with other tanning materials, for producing light shades on all types of leather. American Cyanamid & Chemical Corp.

TAN GR—One of a series of entirely new fast to light acid dyes, particularly

well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.,

TAN RN—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.,

TAN Y—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

TAN YN—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

TAN YR—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

TEGLAC Z-152—A hard, alkyd type resin made from maleic acid. Uses: in sealers, clear and pigmented lacquers, oleo-resinous varnishes. American Cyanamid & Chemical Corp.

TOLYL ALDEHYDE—Para Methyl Benzaldehyde. $CH_3C_6H_4CHO$. Colorless liq. Sp. gr. 1.015 (28°C). B. P. 85-90°C. at 5 mm. Uses: as artificial flavor, synthetic aromatic, pharmaceutical and dyestuff intermediate. The Calco Chemical ical Co., Inc.

TRIACETIN—Glyceryl Triacetate. $C_3H_5(OOC.CH_3)_3$. Colorless, odorless, slightly viscous liq. Sp. gr. 1.160 (15.6°C.). B. P. 258-9°C. Sol: alcohol, ether; slightly sol: water. Uses: mfr. intermediates: as non-poisonous plasticizer for cellulose esters. Niacet Chemicals Corp.

TRIAMYL BORATE—$(C_5H_{11}O)_3B$. Sp. gr. 0.845 (22°C.). Distillation 100% between 220-280° at 760 mm. Index of refraction 1.4128 (22°). Ester content at least 95%. Wt. per gallon 7.05 lbs. Unstable ester which slowly hydrolyzes on standing. Available with amyl group present in its various isomeric forms. Uses: in varnish formulation in conjunction with dispersing of pigments. Sharples Solvents Corp.

TRIAMYLAMINE—$(C_5H_{11})_3N$. Sp. gr. 0.7937 @ (20°C.). M. W. 227. Dist. range 230-260 C. Visc. @ 20°C. 0.02421 Poise. F. P. 174° F. Insol. water. Contains the amyl group in its various isomeric forms. Uses: industries where monoamylamine and diamylamine are used; dye industry. Sharples Solvents Corp.

TRICHLORETHYLENE—$CHCl.CCl_2$. Colorless, volatile liq. Available in 1 c.c. tubes, which are readily crushed, freeing liq. for inhalation. Dose: from 1 to 4 c.c. (1 to 4 tubes) in 24 hours, to be inhaled at suitable intervals, as prescribed by a physician. Uses: treatment of trigeminal neuralgia. The Calco Chemical Co., Inc.

TRIMETHYLAMINE—$(CH_3)_3N$. Easily condensable gas, fishy odor. Boils @ 3.2-3.8°C. @ 765 mm. mercury. Decomposes bet. 800-1300°C. to form hydrogen cyanide and methane. Readily sol. water. One liter of an aqueous solution @ 19°C. contains 410 grams trimethylamine. Product of high purity supplied in water solutions of 25-30% concentration by wt. Highly reactive base; forms addition compounds with halogens; unites with organic and inorganic acids. Commercial Solvents Corp.

TRIPHENYLTIN CHLORIDE—$C_{18}H_{15}SnCl$. M. P. 105-107°C. Forms a nearly insoluble compound with fluoride ions, enabling it to be used as an analytical reagent for the precipitation of fluorides. Eastman Kodak Co.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212-2 Powder. Color—green. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212-2 S Gran. Color—green. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212-2 Powder. Color—ivory. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212-2 S Gran. Color—ivory. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212-2 Powder. Color—red. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA-FORMALDEHYDE MOLDING POWDER—Grade 212 S Gran. Color—red. Supplied in powder form in a wide range of colors. Sp. gr. (low pigment) 1.48-1.50; (high pigment) 1.54-1.55. Tensile strength 5,000 to 7,000 lbs. per in. Highly dielectric, heat and water resistant, non-refusible. Uses: general utility and decorative types plastics; especially for premiums. Synthetic Plastics Co., Inc.

UREA LAMINATED—Laminated by Westinghouse from paper impregnated with Beetle syrup. Synthetic Plastics Co., Inc.

URSULIN—A sulphonated vegetable oil especially treated and recommended for use in the manufacture of all types of white leather. Due to the purity and light color of the oil it will not spue or cause any discoloration to the leather. American Cyanamid & Chemical Corp.

555 VARNISH—Consists of 60% thermo-setting phenol-formaldehyde resin and 40% alcohol. Viscosity 0.75 to 3.50

centipoises. Uses: mfr. strips for refrigerators, wrapped tubes and coils, radio parts, tops for tables, wall panels, impregnated coils, etc. Resinox Corp.

VINSOL—A hard, black, tough, non-tacky oil resistant resin for use in insulating varnishes and compounds, impregnating compositions, lacquers, emulsion paints and thermoplastics. The Hercules Powder Co., Inc.

WOOD FLOUR—Grade "EC". Screen—Ret. 45M—Trace; Ret. 60M—4.6%; Ret. 80M—10.2%; Ret. 100M—27.3%; Through 100M—57.9%; Total 100.0%. Weight per cu. ft. 10.5 lbs. Average moisture 3.8%. Resin content 4.2%. Fibrous in nature. Lends itself readily to dyes or pigments in any composition. Uses: filler plastic molding (Bakelite, Durez, etc.). Becker, Moore & Co., Inc.

WOOD FLOUR—Grade "ECT". Screen—Ret. 20M—0.0%; Ret. 35M—0.8%; Ret. 45M—1.2%; Ret. 60M—8.3%; Ret. 80M—28.6%; Ret. 100M—44.8%; Through 100M—16.2%; Total 100.0%. Wt. per cu. ft.12.8 lbs. Average moisture 5%. Resin control 5%. Lends itself readily to dyes or pigments in any composition. Uses: filler dolls, wall paper, rubber compositions, dynamite, etc. Becker, Moore & Co., Inc.

WOOD FLOUR—Grade "R". Screen—Ret. 45M—0.0%; Ret. 60M—9.6%; Ret. 80M—20.1%; Ret. 100M—19.6%; Through 100M—50.7%; Total 100.0%. Wt. per cu. ft. 11.5 lbs. Average moisture 4.6%. Resin content 5%. Lends itself readily to dyes or pigments in any composition. Uses: filler inlaid linoleum, rubber compositions, flooring, plastic wood, molded synthetic wood articles, etc. Becker, Moore & Co., Inc.

WOOD FLOUR—Grade "REC". Screen—Ret. 45M—Trace; Ret. 60M—1.8%; Ret. 80M—7.6%; Ret. 100M—22.8%; Through 100M—67.8%; Total 100.0%. Wt. per cu. ft. 9.8 lbs. Average moisture 3.5%. Resin content 3.6%. Very fine and fibrous. Lends itself readily to dyes or pigments in any composition. Uses: filler for special molding applications. Becker, Moore & Co., Inc.

WOOD FLOUR—Grade "RT". Screen—Ret. 20M—0.0%; Ret. 35M—4.5%; Ret. 45M—9.5%; Ret. 60M—33.0%; Ret. 80M—29.5%; Ret. 100M—17.0%; Through 100M—6.5%; Total—100.0%. Wt. per cu. ft. 14 lbs. Average moisture 6%. Resin content 6%. Lends itself readily to dyes or pigments in any composition. Uses: filler hand soap, polishing and cleaning, etc. Becker, Moore & Co., Inc.

1.3.5 XYLENOL—1.3 Dimethyl 5 Hydroxybenzene. Colorless needles. Sp. gr. 1.005 (25°C.). M. W. 122.12. M. P. 64°C. B. P. 219.5°C. Slightly sol. water. Sublimes easily; volatile with steam. Industrial product M. P. 60-64°C. Uses: mfr. resins, disinfectants. The Barrett Co.

YELLOW 2G—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

YELLOW R—A non-subliming clear yellow of excellent brightness for rotogravure ink. This type also surpasses any of the other colors on the market, and is regarded very highly by mfrs. of inks for rotogravure work. The Calco Chemical Co., Inc.

YELLOW RS—One of a series of entirely new fast to light acid dyes, particularly well suited for dyeing fast shades on leather, and printing of unweighted and tin weighted silk. Their unusual fastness to light and exceptionally good resistance to washing and milling on textile fabrics without after treatment renders them an extremely important addition to the dyestuff line. The Calco Chemical Co., Inc.

YELLOW TONER #3065—A product of nitro-P-toluene-azo acetoacetic anilide. Very permanent. Uses: dry color lake in plastic and rubber industries. Brooklyn Color Works, Inc.

Safe Floor Loads

Following loads should be allowed for in calculating the strength of floors:—

For light loads	102–153 lb. per sq. ft.
For medium heavy loads	204–306 " "
For heavy loads	408–613 " "
For very heavy loads	over 613 " "

Advantages and Disadvantages of Different Types of Flooring

(1) Concrete—Level, non-slip, easily cleaned, inelastic, cold to the feet. Wear takes place with heavy traffic causing dust to be formed in spite of hardening the top surface by various methods, e. g. chemical treatment or laying of hard top surfacing; where there is only little wear, the former method is suitable, in other cases the second method must be used. It is necessary to have expansion joints. Repairs are difficult. Precast concrete slabs can be used. Terrasso (concrete containing marble chips) is suitable for passages, entrances, wash-houses, etc.

(2) Xylolite—Level, dustless, elastic, warm to the feet, non-slip; it disintegrates in places after several years use. Very suitable for light wear, also for laboratory and offices. Not suitable for use in damp or steamy rooms.

(3) Asphalt (ordinary grade)—Level, dustless, elastic, odorless, warm to the feet, easily repaired, is affected by oil, acids, and alkalies. Softens in hot weather, so that at temperatures above 35° C. it becomes indented under pressure. The hard grade of asphalt softens at 70° C. Special types of asphalt are acid-resisting. Pressed asphalt slabs laid with narrow joints also may be used.

(4) Wood (pine blocks)—Resistant, level, dustless, elastic, non-slip, warm to the feet, easily repaired, but costly. Blocks of 4-10 cm. thick are used for light and very heavy loads. By attaching the blocks to wooden boards, an almost jointless floor is obtained. Oak or box is very suitable for light wear or for offices. Blocks may be laid in asphalt, or maple board laid on pine planks for fairly heavy wear.

(5) Iron—Cast iron plates 15-20 mm. thick with checkered surface, laid in cement or asphalt are suitable for rough wear.

(6) Tiles, etc.—Used in places where alkali, acid, oil, and water are present. Tiles should be laid in Trinidad asphalt, or in a cement low in lime. Two or 3 layers of asphaltic roofing-felt laid beneath the tiles form an added precaution.

(7) Linoleum—Level, dustless, easily cleaned, noise preventing, bad conductor of heat, non-slip, worn places are easily renewed. Suitable for offices, or for laboratories or work rooms, which have to be kept particularly clean.—*Zellstoff u. Papier*, 1933, 13, 167-168.

Chemical Consumption

A digest of new products and processes in process industries for the user of chemicals.

Salting Stains on Hides and Leather

By C. D. Looker

Practically all stains have been referred to from time to time as salt stains, whereas in most instances they have been caused by lack of salt rather than too much salt or impurities in the salt. Some have been caused by impurities in no way connected with salt; by improper handling of both salt and hides in the hide cellar, in transit and at the tannery; by large pieces of shale and other impurities in the salt itself, either those originally present or as contamination in re-used salt.

Tanners have considerable difficulty overcoming the brown stains which occur along the edge folds of the pack and the so-called salt burn spots which are distributed all over the hides. Much careful experimental work has been reported concerning causes of stains, chief among these being: Bacterial action, grease or fat stains, iron from blood or other sources, copper salts of calcium, especially calcium sulfate, salts of magnesium, phosphates capable of forming phosphoric acid, improper washing to remove blood, etc., hard water containing lime salts, insufficient salting, re-using contaminated salt, too low temperature during early stages of curing, too high temperature during curing, too long time of curing, and too long time in storage under unfavorable conditions before tanning.

Brining hides for a few hours before salting seems logical and feasible. Perfectly clear filtered brine can now be made automatically from rock salt by a special patented rock salt dissolver, thereby making brine available without extra expense. Methods of laying hide packs differ but the general procedure is to pile the hides hair side down with a layer of salt beneath the bottom hides. The flesh side of each hide is salted as it is laid down, being covered more or less uniformly with coarse rock salt No. 2 or a mixture of 75 per cent. No. 2 and 25 per cent. No. 1 by throwing the salt from a shovel. It is common practice to use 50 per cent. washed or unwashed salt from a previous curing with 50 per cent. fresh salt. After the salt has been spread, the edges are folded in all the way around the outside of the pack. This brings flesh into contact with flesh around the edges of the pack and forms a pocket which prevents loss of brine. Most packers insist on an extra amount of salt on the inside of the fold.

In a pack of hides the following conditions prevail: In the center hair is piled against salted flesh; on the edges under the folds flesh is piled against salted flesh of the same hide; at the corners hair is piled against hair of the same hide, and on the fold all the way around the edge of the pack, hair is piled against hair of a different hide. All of these exposed surfaces of fresh hide are supposed to be covered with salt before the next hide is laid down, but in the rush of building a large pack how often are these folds of fresh hide insufficiently salted and required to wait till brine forms and soaks over and through the hides to preserve them. It requires considerable time for brine to soak through a hide from the flesh side to the hair side, and it is the hair side that usually makes the surface of highly finished leather. If the hides are wet when laid down, however, a dilute brine quickly forms and runs over the edge.

Hides require at least four weeks to cure and in a small plant those at the bottom of the pile may not be removed for a much longer time. This permits the ones in the bottom of the pack to be exposed for a longer time to the action of any colored substances that may soak out of the hide, hair, or foreign material adhering to the hide such as blood, manure, vegetation, or soil. If conditions of temperature and moisture are right, bacterial growth may be encountered during this period.

Pronounced brown stains often occur on the hair side of the hide along the edge of the folded part. This section of the hide is the one that forms the outside edge of the pack and is the only part of the hide that is permanently exposed to the air of the curing cellar. It is also the only part of the hide that never receives a direct application of salt. The stain is more prevalent in hides from certain cellars than others.

Since the stain is invariably brown at the edge of the fold, it has been thought that it was due to iron in the salt. If this were true, stains would appear on the body of the hide as well as on the edges. It is scarcely possible that iron from rock salt could be a contributing factor because analysis by the United States Bureau of Standards, in 1931, showed that mined salt from United States mines contained either no iron or not more than three ten-thousandths of 1 per cent. of iron. On the other hand, hemoglobin, the red coloring matter of blood, is an iron compound containing four-tenths of 1 per cent. of iron. There are bacteria that increase on bloody hides even in the presence of strong salt solutions. Some bacteria work better in contact with moist warm air than they do with the air practically excluded as it would be inside the salted hide pack. Therefore, at the beginning of the cure, before the folded edge of the green hide has become soaked with brine, bacterial action would be greatly increased by the presence of blood, whereas on the interior of the pack the

brine would quickly form and partially inhibit bacterial action.

It is much more logical to try to prevent a stain from forming than to try to remove it after it has formed. Some packers are producing hides practically free from fold stains by using 100 per cent. new salt and building their packs so that there is a minimum amount of folding at the edges along the sides and ends of the packs. Some packers have abandoned use of the larger sizes of rock salt entirely and are using a smaller weight per hide of C. C. or ice cream salt. This grade of salt costs no more than No. 2 and No. 1. It distributes itself more evenly over the hides when thrown from the shovel and sticks to the uneven high spots on the hide surface, thus assuring that all areas are completely covered. Recently an observation showed that when No. 2 salt was used exclusively there were sections as large as 25 square inches that did not receive any salt. This was noticed on different hide packs both at the time of laying the hides and at the time of removing them. When it is remembered that fresh hides are full of bacteria and are decomposable material, it is little wonder that putrefaction begins in such localities and produces so-called "salt-burns," malt stains, etc., before brine can form in the surrounding regions and penetrate to the unsalted area.

There is practically no salvage value in the finer grades of salt, but the advantages in their use far outweigh any apparent losses that might be incurred because of this. There is less shale in them, the particles of shale are smaller and do not cover as large an area of hide, thus enabling the brine to preserve the hide more quickly beneath individual pieces, they distribute more uniformly, go into solution more quickly, yet are large enough not to be completely dissolved by hide water; a reasonable amount clings to the cured hide to prevent losses after the hides are bundled; the actual loss of salt is not appreciably more than is lost in the customary discard and in the brine lost by washing. Furthermore, there is no concentration of large pieces of shale due to washing or re-using. The largest pieces of shale occur in the largest sizes of salt.

There are those who will not agree that C.C. salt can be used successfully. It may not be so good for the large pack that must be left for more than sixty days. If No. 2 salt is used, it should contain enough small sizes to assure sufficient dissolution to start the cure quickly.

Another contributing cause of fold stains is the space saving custom by some packers of laying one pack of hides so that it touches a pack already laid or of laying two packs of fresh hides in contact with each other. There are certain kinds of molds and salt loving bacteria that thrive under conditions of this kind where the free circulation of air is prevented and the temperature and humidity of the hide cellar are not controlled.

There is another kind of stain that occurs in spots and streaks on the surface of hides. These spots do not appear to be localized in any particular area. Tanners call them salt burns. The skin looks as though it had been freshly burned with a hot object. The spots, which occur on the hair side, have a yellowish cast on the hide as it comes from the unhairing machine. The surface is somewhat rougher than that of adjacent regions. Some of the spots appear in whorls like those formed by ring worms; others appear as if they were formed by a splash of hot liquid. Some of them are about the size of a lump of shale or salt.

It is quite probable that these spots were caused by bacterial action or enzymatic changes due to lack of salt in regions as those mentioned previously. These may be produced either because two parts of the hide came into contact with each other, shutting off the free circulation of brine and allowing decomposition to set in before salt had a chance to prevent it, or by pieces of shale, clay, manure, sticks, or stone which kept the brine away from the hide. The trouble has always been blamed on the salt but it seems more logical to assume that it is caused by the lack of salt. If hide and salt are both dry, however, dehydration may take place rapidly and produce a burn, or dehydration may occur after the hides are bundled and held in storage.

Stains of this nature are thought by some to be caused in the lime liquor by particles of undissolved lime coming in contact with the hide because the presence of calcium carbonate has been identified in them. These stained areas may well absorb and hold lime which is converted to the carbonate on contact with air. The carbonate theory does not seem reasonable for all stains of this nature because hides from one packing house when soaked in the same lime liquor as those from another developed these stains and the others did not, thus indicating that the stain was present before soaking.

Coarse grades of rock salt should never be used in salting calf skins and sheep pelts because of the danger of the hard jagged pieces of salt, as well as shale, puncturing the skin. Most packers today are using evaporated salt or F. C. Rock Salt on their calf skins and sheep pelts with excellent results. Brining, however, is the ideal way to cure calf skins.

The following suggestions are the principal ones contained in this paper:

1. Brining the hides for a few hours before salting in the pack will serve to prevent many causes of stain.
2. Use exclusively C.C. grade of salt, or if coarser grades are preferred, use enough fine salt to form a quick initial cure on heavy hides and do not reuse any washed or unwashed salt. The loss of C.C. salt after the pack is cured should not be any greater than the present losses in washing No. 2 residue and discarding that portion clinging to the hides.
3. Do not fold hides along edges of packs any more than enough to keep edges of pack even.
4. When hides are folded and hair is piled against hair, there should be a layer of salt on the hair side of the fold, thus bringing salt between the two layers of hair.
5. Use an extra amount of salt on the inside of the fold so that there will be enough brine to penetrate to the outside.
6. Keep edges of pack moist by spraying with saturated brine and by controlling the temperature and humidity of the room. Both salt and hides should be moist when the pack is laid down to prevent excessive localized dehydration.
7. Keep packs separated from each other by at least 10 inches to allow access of air and prevent molding of the edges and action of bacteria if temperature and humidity of hide cellars are not controlled.
8. Use evaporated salt or F.C. rock salt for curing sheep pelts.
9. Use evaporated salt, F.C. rock salt or brine for curing calf skins.—Abstracted from *Hide and Leather*, November 11, '33, p. 20.

Leather

Patent Leather Varnishes

Nitrocellulose varnishes of various types are being largely used both here and abroad in the manufacture of patent leather. Several coatings of varying linseed oil content are often given, the highest percentage of oil being used in the first coat. In the cold varnish method, a nitrocellulose lacquer is used without linseed oil. The most commonly employed brand of nitrocellulose employed in Germany is "Wasag-wolle" (No. 8 or 8a), using equal parts of plasticizer, preferably a mixture of tricresyl phosphate or dibutyl phthalate with suitably prepared castor oil. The linseed oil should be previously heated to about 275° with some umber or Berlin blue. The following table gives the composition of varnishes now in common use:

	First Coating Per cent.	*Second Per cent.*	*Third Per cent.*
Nitrocellulose, Wasag 8	10	8	8
Tricresyl phosphate	3	2	4.5
Castor oil	12	7	—
Ethyl-glycol	—	—	5
Butyl acetate	20	20	20
Ethyl acetate	5	5	5
Butanol	10	8	13
Toluol	37	45	34
Xylol	3	5	10.5

For coloring, a suitable black dye soluble in alcohol or benzol is Sudan Black, etc. The first coating is well rubbed into the

leather, but the second and third coatings may be sprayed; and the leather is well pressed hot in a hydraulic press after the first coating, and also after the complete drying of the last coat. As some leathers are very absorbent, a pore-filler or impregnating material is first applied.

Basic Aluminum Salts for Tanning

Use of basic salts of aluminum in place of basic salts of chrome in the leather industry is considered as a possibility abroad. It has been found that the precipitating effect of these salts on a tannin solution is a function of their basicity, and may be utilized in the retanning of vegetable tanned leathers to insolubilize partially the excess of tannin and improve the quality of sole leather.

Estimation of Nitrogen in Leather

When an organic nitrogen compound is heated in a current of hydrogen in the presence of finely divided nickel, all nitrogen is converted into ammonia. A very small quantity of very finely divided leather is weighed into a nickel or porcelain boat, covered with ten per cent. KOH solution, and allowed to stand for 15 minutes. Reduced nickel is then added and the boat placed in a quartz combustion tube behind the nickel-impregnated catalyst. Hydrogen is passed through and the boat carefully heated, while that part of the tube containing the catalyst is maintained at about 250° C. The ammonia formed is collected in a little water, and the solution directly and continuously titrated with 0.1 N acid from a micro burette, one drop of Methyl Orange being used as indicator. This method frequently gives higher results than the macro or micro Kjeldahl methods, but the procedure is simpler and more time saving.

Rubber

Plantation Rubber

The effects of a number of factors in the manufacture of smoked sheet on the rate of cure of the finished product as shown by tests using a "pure gum" type of stock accelerated with Captax have been studied on a rubber plantation. Stock used for the tests shows generally that the rate of cure varies in a manner similar to that reported by various investigators who used a rubber-sulfur stock in their studies. The results obtained are as follows:

1. Large-scale blending shows that no improvement in uniformity is obtained in increasing the size of the blending unit from 500 gallons to 10,000 gallons of latex. 2. The longer the trees are in tap, the faster is the rate of cure of the rubber produced from the latex. 3. The use of formaldehyde or sodium sulfite as a latex stabilizer produces a slower curing rubber than does ammonia. 4. A large increase of formic acid produces a sheet with a faster rate of cure. 5. Reduction of latex concentration at the time of coagulation reduces the rate of cure. 6. Increasing the length of time of coagulation increases the rate of cure. 7. Soaking the freshly milled sheets, prior to smoking, reduces the rate of cure. 8. Increasing the drying temperature reduces the rate of cure.

The conclusion arrived at is that the consumer probably will have to blend his rubber in order to obtain a uniform raw material because of the seasonal variations and the practical and economic difficulties standing in the way of production of an absolutely uniform product. Abstract of an address by George Sackett before the American Chemical Society.

Sodium Nitrite in Coagulating Rubber Latex

By adding sodium or other nitrite to latex prior to coagulation with an acid a soft rubber is obtained. Softness and plasticity of the rubber depend upon the amount of nitrite added, the amount of coagulant, and the period between coagulation and working-up. 0.1 per cent. nitrite has an appreciable effect; one per cent. yields a very soft product. Insufficient acid to react with all the nitrite produces a hard leather, as does also an excess of acid. The longer the coagulum remains in the serum before machining, the softer the product obtained. The speed of the reaction may be increased by heating the coagulum.

Paper

Viscose Transparent Paper

Operation of a moderate-sized viscose foil producing plant said to be capable of an output of 2,000 to 3,000 square metres of finished material per 8 hour day and which can be satisfactorily operated by six or seven hands is described by J. Eggert in the October issue of *Kunstoffe*.

Preliminary production of cellulose xanthate is effected in a universal vacuum disintegrator where a 100 kg. batch of wood pulp is treated with about 600 kg. of 18 per cent. caustic soda-sodium carbonate solution for about two hours at a temperature increasing from 15° to 42° C. Excess lye is removed from the disintegrated alkali cellulose in a suitable filter press whence it is returned to the disintegrator when its weight is about three times that of the original untreated cellulose. Transformation into cellulose xanthate solution is there effected by stirring for 3 hours at 23° C. with the calculated quantity of carbon bisulfide and alkali, a total period of three hours being required for this stage. In all, 100 kg. wood pulp can be converted into viscose in ten hours, and a single worker can deal with the various steps if an automatic universal disintegrator is used.

The actual process of foil formation is preferably carried out with the aid of a slit pouring machine through which a continuous length of viscose passes into a coagulating bath where it is supported by a series of rollers until sufficient firmness is acquired. An ample interval for ripening of the viscose is, of course, essential, prior to conversion into foil. Emerging from the coagulating bath, the cellulose sheet passes in succession through three salt baths of varying composition. The first contains sodium chloride and a little ammonium hydroxide, the second comprises sodium chloride and a small proportion of sulfites, while the last of the series is a pure sodium chloride solution. Owing to the speed with which the baths are contaminated by the decomposition products of cellulose xanthate, arrangements should be made for their continuous filtration or regeneration. A weakly acid reaction should be imparted to the final bath by means of an organic or inorganic acid.

Complete decomposition of cellulose xanthate is achieved in a supplementary bath by treatment with formic acid or other convenient acid while the regenerated transparent cellulose sheet is being rolled up. An interval of 12 to 24 hours is permissible before proceeding to the bleaching, finishing and drying operations. Installation of extensive plant and a high wage bill are avoided by using comparatively expensive bleaching agents, such as sodium peroxide or hydrogen peroxide, which can be applied by simple methods. The weakly acid sheet of foil is passed into the bleaching bath without preliminary washing, and then de-chlorinated and washed before drying on rustless steel rolls with the aid of warm air.

Preserving Written Records

A recent invention which dispenses alike with paper and ink, parchment and pigment, as retaining media for writings merits attention. The inventor set out to provide a method of recording which would be proof against all forms of decay, impermeable to insects and bacterial infection, and capable of withstanding neglect or burial in earth, swamp, or water. No animal or vegetable tissue appeared to fulfil these conditions and after many tests gold and the platinum group of metals were accepted for trial, the discovery eventually being made of the first satisfactory method of imprinting platinum characters and half-tones upon gold. The thin sheets of gold are one four-thousandth of an inch

in thickness. They will bend, but not crumple. Gold above 18 carats is too soft for the process; below 14 carats contains too many impurities to ensure permanence; but between these limits excellent results appear to be attained.

Patents—Cellulose

Method of manufacturing cellulose of high alpha content and quality. No. 1,931,575. J. J. de la Rosa, Yuinucu, Cuba.

Process for increasing solubility of certain cellulose esters. No. 1,931,844. M. Hagedorn & G. Hingst, to I. G. F., Frankfort.

Manufacture of 95% alpha cellulose pulp. No. 1,931,933. W. D. Nicoll, to Du Pont Co., Wilmington, Del.

Excess caustic soda in preparation of cellulose xanthate. No. 1,932,751. G. A. Richter, to Brown Co., Maine.

Pulping process of chlorine gas and air on alkali-treated fiber. No. 1,932,904. Ralph H. McKee, New York.

Ammonium sulfide and hydroxide in de-nitrating action on spun nitrocellulose products. No. 1,933,204. H. P. Bassett, Kentucky.

Recovery of plasticizers from Celluloid and like plastic compositions by alcohol. No. 1,933,205. H. P. Bassett, Kentucky.

Cellulose acetate from refined pulp-lactic acid. No. 1,933,676. J. W. McKinney, to Brown Co., Berlin, N. H.

Separation of objectionable elements from organic esters of cellulose. No. 1,933,720. C. Dreyfus and G. Schneider, to Celanese Corp., N. Y. City.

Cellulose organic ester containing benzyl ether of a hydroxybenzene. No. 1,933,794. L. W. Eberlin & J. J. Schmidt, to Eastman Kodak Co., Rochester, N. Y.

Decorations from color changes in cellulose ester plastic material. No. 1,933,810. W. J. Kenyon and C. J. Staud, to Eastman Kodak Co., Rochester, N. Y.

Production of mixed cellulose esters. No. 1,933,815. C. J. Malm and C. E. Waring, to Eastman Kodak Co., Rochester, N. Y.

Cellulose acetate containing p-phenyl benzoate. No. 1,933,822. T. F. Murray & C. J. Staud, to Eastman Kodak Co., Rochester, N. Y.

Complex cellulose organic ester composition. No. 1,933,826. Henry B. Smith, to Eastman Kodak Co., Rochester, N. Y.

Cellulose ester with ethyl gamma-phenoxy butyrate. No. 1,933,827. H. B. Smith, to Eastman Kodak Co., Rochester, N. Y.

Mixed cellulose nitroacetate higher fatty acid esters. No. 1,933,828. C. J. Staud & C. E. Waring, to Eastman Kodak Co., Rochester, N. Y.

Cellulose acylnitrate. No. 1,933,829. C. J. Staud & J. T. Fuess, to Eastman Kodak Co., Rochester, N. Y.

Fibroin-cuprammonium process for artificial silk. No. 1,934,413. Gustavus J. Esselen, to Corticalli Silk Co., Florence, Mass.

Powdered anti-dusting cellulose acetate, retaining electro-static charges. No. 1,934,450. S. E. Sheppard and L. W. Eberlin to Eastman Kodak Co., Rochester, N. Y.

Low viscosity cellulose fiber. No. 1,935,129. George A. Richter, to Brown Co., Berlin, N. H.

Cellulose fiber mass having colloidal complex for preservative. No. 1,935,-196. E. C. Lathrop & F. A. Irvine, to Celotex Co., Chicago.

Two-step process for fiber liberation; and the treatment of cellulose fiber. Nos. 1,935,579-80. G. A. Richter, to Brown Co., Berlin, N. H.

Molding composition of hydrolyzed ligno-cellulose, furfural and mineral acid. No. 1,932,255. E. C. Sherrard and E. Beglinger, Madison, Wisc., to The Government and People of the U. S.

Artificial leather, baked fabric coated by polyhydric alcohol-polybasic acid resin. No. 1,934,709. A. J. Hemmer, to Du Pont Co., Wilmington, Del.

Coatings

"A. S. T. M. Standards on Preservative Coatings for Structural Materials" contains all of the 92 standard and tentative specifications, methods of test and definitions, issued by American Society for Testing Materials, covering pigments, oils and thinners, varnish and varnish materials, lacquer and lacquer materials and miscellaneous related subjects. It is the 1st time this material has been compiled in a single publication.

Book includes a number of tentative specifications which were approved this year (1933) and also gives in their latest form the 16 standards which were adopted during 1933. All of the revisions of standards which had been tentative and were adopted as standard this year are included.

New tentative specifications cover the following materials: spirits of turpentine; shellac—and centrifuged shellac—varnish; tricresyl phosphate; industrial benzene; industrial toluene; solvent naphtha; and test methods for soluble nitrocellulose base solutions.

Materials covered by standards adopted in 1933 include the following: raw tung oil; boiled linseed oil; dry bleached, and orange, shellac; soluble nitrocellulose; ethyl acetate; normal butyl acetate; butanol; amyl acetate; amyl alcohol; butyl propionate; ethyl lactate; and acetone. Also methods of sampling and testing shellac and lacquer solvents and diluents.

The 7 standard methods of testing in which revisions, previously published as tentative, were adopted as standard include 6 methods of routine analysis, covering dry red lead, yellow, orange, red and brown pigments containing iron and manganese, titanium pigments, dry cuprous oxide, dry mercuric oxide and white pigments. Test methods for hygroscopic moisture in pigments and methods of sampling and testing turpentine are also included.

In addition to materials listed above many others are covered by standard and tentative specifications and test methods, including a number of pigments, oils and thinners, varnish and varnish materials.

Copies of this publication, aggregating 350 pages, in a heavy paper cover, can be obtained from A. S. T. M., 1315 Spruce st., Philadelphia, Pa., at $1.25 per copy.

Patents—Coatings

Pyroxylin coating composition with ester gum or copal hardening agent and castor oil condensation product base. No. 1,934,261. C. T. Ellis, to Sherwin-Williams Co., Cleveland.

Wrinkle-finish varnish, Chinawood oil-fusible rosin base. No. 1,934,034. G. H. Burgmann, to G. J. Liebich Co., Chicago.

Coating composition, castor oil-polybasic organic acid. No. 1,933,697. H. J. Barrett, to Du Pont Co., Wilmington, Del.

Tenacious resin-free hydrocarbons, gum, for impregnating wood and other fibrous material. No. 1,933,573. F. F. von Wilmowsky, N. Y. City.

Auto-oxidizable varnish of metal salt from alkylated phenol monocarboxylic acid derivative. No. 1,933,520. H. A. Bruson, to Resinous Products & Chem. Co., Philadelphia.

Coating for metals of induratable artificial resins, tar-oil and anthracene. No. 1,932,699. H. Klas, to Stahlwerke A. G., Dusseldorf, Germany.

Protective covering, cellulose compound film sulfur-treated. No. 1,932,517. J. C. Ford and E. Olsen, Madison, Wis.

Cellulose nitrate film outside, casein-glycerine film inside, for tire cover. No. 1,934,711. D. G. Higgins, to Du Pont Co., Wilmington, Del.

Miscellaneous

Concrete Dispersing Agent

A new agent, known as Dacene, imparts certain valuable properties to concrete when included integrally in the mix. As used with Portland cement, the optimum proportion by weight is 1 pound to a barrel of cement, or 0.25 per cent. Used in this proportion the slump or fluidity is increased; strength is greater at all ages; and early strengths are much greater. The increase in fluidity permits a decrease in the amount of mixing water, resulting in an increase in strength, actually about 20 per cent. greater than would be anticipated from the water ratio law. No sacrifice of density follows its use and high early strength concrete is formed at an insignificant cost. Where a pigment is added, this product not only nullifies the usual loss of strength, but actually causes an increase.

Artificial Coloring For Flowers

To find a more ready market for the sale of oversupplies of white flowers and to touch the public fancy more easily, a new group of dyestuffs has been developed abroad which when applied, diffuse into the flowers at different rates, thereby often giving variegated effects most pleasing to the eye. Flowers are allowed to stand in a dilute solution of the color, and a little vinegar or weak acetic acid added to aid the penetration. The new colors are sold as dry powders.

Determination of Perborates in Detergents

0.1 gram of the substance under test is dissolved in 100 c.c. of water; the solution is then poured into 100 c.c. of 2N sulfuric acid containing 1 gram of Mohr's salt. 10 c.c. of a 10 cent. per solution of potassium sulphocyanide is now added, and the solution is titrated by means of an N/20 solution of titanium trichloride, until it is decolorized. During the titration, a little sodium bicarbonate is added from time to time.

This method is suitable for the determination of the perborates themselves. In the analysis of detergents, about 1 gram of the product is dissolved in 150 c.c. of water at 35-40°C. The solution obtained is slowly poured into the sulfuric-acid solution, and the determination carried out as described above. The fatty acids which separate on acidification do not interfere

appreciably with the method. The process consists essentially in the oxidation of the titanium trichloride into the tetrachloride. It is stated that the permanganate method does not always give good results owing to the presence of reducing substances in many commercial detergent mixtures.

Activated Carbon from Cork Waste

The possibility of the production of activated carbon from cork waste is being studied in Spain by a special commission. Laboratory and industrial trials on the subject have been carried out at the Central Engineering School in Madrid, and are reported to have given excellent results. The objective is the manufacture of a whole range of carbons utilizing the various processes of activation.

Metals and Alloys

Chromium Deposits from Plating Baths

In a recent investigation by the Bureau of Standards, an attempt was made to obtain chromium deposits from plating baths that would have a higher efficiency, a wider range for bright deposits and better throwing power. Solutions using chromic sulfate, chromic fluoborate and chromous sulfate were investigated, and the results showed that while it is possible to obtain bright deposits from these baths, they are inferior in all of the above respects to the chromic acid bath. With the existing knowledge there is very little prospect of developing a bath that will be superior to the present chromic acid bath.

Surface Treatment for Silver

By treating with a solution containing chromic acid, an invisible protective coating is formed on the surface of silver or silver alloys. Cuprammonium chloride, a persulfate, or both of these may be added to the solution. The metal is preferably first degreased, then immersed in the solution, washed and dried.

Chemical Coating for Metal

A protective coating has been developed for the German Elektron metal. The metal consists of 90 per cent. of magnesium, the remaining 10 per cent. being aluminum, tin and manganese. Treatment follows with nitric acid and 10 per cent. potassium bichromate, and a yellow chromate coating is formed. In addition to this chemical coating, a coat of lacquer is said to afford sufficient anti-corrosive protection, even to welded seams. Welding of Elektron is further facilitated by a mixture of fluorides of potassium and lithium. With the aid of potassium nitrate the surface of Elektron articles may be oxidized; this oxide also taking acid dyes so that such objects may be dyed in different colors. Such treatment also affords effective protection against corrosion.

Textiles

Month's New Dyes

Indanthren Scarlet 4G Paste

An addition to the General Dyestuff range of red Indanthren dyestuffs. A homogenous product which dyes on cotton, viscose and pure silk beautiful yellowish scarlet shades, more yellowish and much clearer than those produced with Indanthren Scarlet GG. The dyeings have excellent fastness to light, washing and chlorine, and withstand, if the usual precautions are observed, to the boiling soda chlorine bleach. Also suitable for machine dyeing, due to its very good solubility. It is not recommended for curtain materials or hangings. Dyeing process given in booklet issued by the company.

Leucosol Yellow K Paste

A vat color of the anthraquinone series prepared especially for the printing trade by the Dyestuff Division of du Pont. It is a non-drying paste; and claimed to be grit-free, non-foaming, and does not yield specky prints, settle out, or form crusts in the barrel. Is fast to light, soaping and commercial laundering, and is applicable to cotton, silk or rayon which is to be used for dress goods, draperies and similar materials.

National Alizarol Cyanine RC

A new product of National Aniline which gives bright reddish blues of excellent fastness to sea water, perspiration and rubbing and of good fastness to washing, fulling, potting, cross dyeing and alkali spotting. Possesses fair fastness to light, but its brilliance of shade and other properties merit its use alone or in combination on raw stock, yarns and pieces for a variety of purposes. Cotton, rayon and acetate silks are unstained. A sample card is issued by the manufacturers.

Patents—Textile

Products from urethane for assistance in the textile industries. No. 1,933,945. H. Ulrich & K. Saurwein, to I. G. F., Frankfort, Germany.

Desulfurizing rayon in package form by solution sulfide of ammonia with ammonium hydrate. No. 1,932,789. H. B. Kline, to Industrial Rayon Co., Cleveland.

Filament delustering by solution of baryta, aluminum sulfate, water and an emulsion. No. 1,932,734. F. Hoelkeskamp, Germany, to American Bemberg Corp., N. Y.

Pyrogenic decomposition and condensation, for the making of aliphatic anhydrides. No. 1,931,687. Henry Dreyfus, and C. I. Haney, to Celanese Corp., N. Y. City.

Company Booklets

C73. American Cyanamid Co., 535 5 ave., N. Y. City. November December issue of American Hortigraphs and Agronomic Review contains the usual number of interesting and instructive reports of the latest experimental work on fertilizers and crops.

C74. Bakelite Corp., 247 Park ave., N. Y. City. October issue of the *Bakelite Review* features Bakelite's colorful new resinoid, in addition to the usual number of illustrated new uses for Bakelite's various plastics products.

C75. The Columbia Alkali Corp., Barberton, Ohio. Data sheets on "Calcene"—Columbia's new calcium carbonate reinforcing pigment for rubber.

C76. E. I. du Pont de Nemours & Co., Wilmington, Del. *The du Pont Magazine* for November features: (1) a review of the various products recently brought out during the Depression; (2) "Pyralin and Plastacele as Protectors"; (3) report on new thermoplastic cement; and several other novel and new uses for du Pont products.

C77. General Electric, Plastics Dept., River Wks., West Lynn, Mass. GEA-937C is a new price list of "Textolite" laminated and molded products, together with complete engineering data. Supersedes GEA-937B.

C78. General Plastics, Inc., North Tonawanda, N. Y. The Durez Primer, an 8 page booklet, illustrates and explains 7 different applications for phenolic resin materials-laminating varnishes, resin-impregnated paper, paint and varnish resins, Plywood-bonding resins, insulating varnishes and resins for casting cores, in addition to molding compounds. Industrial applications of each are reviewed.

C79. Hercules Powder Co., Wilmington, Del. If you like a real, old-fashioned Wild West magazine then the October issue of *The Hercules Mixer* will prove most satisfactory. This issue is just as clever as the recent "Time" number.

C80. Industrial Chemical Sales Co., 230 Park ave., N. Y. City. An American Story of Precipitated Chalk, by T. G. Leek, chemical engineer of Industrial Chemical Sales, is an authoritative study of Show Top Precipitated chalk and its physical and chemical properties that make it desirable in the drug and cosmetic industries.

C81. Mallinckrodt Chemical Wks., St. Louis, Mo. November price list contains a number of very important price advances, largely the result of currency fluctuation and the uncertainty surrounding the dollar in countries where raw materials are exported from.

C82. Philadelphia Quartz Co., 121 S. 3rd st., Philadelphia. *P's & Q's* for November is devoted to a discussion of sodium metasilicate in the laundry.

C83. Rossille Commercial Alcohol Corp., Terre Haute, Ind. *Rossville Alcohol Talks* for November deals with the final part of the story of alcohol in the petroleum field.

C84. Haveg Corporation, Newark, Del. This is the 2nd booklet gotten out by the Haveg Corp., (American manufacturer of a protective material made from asbestos and a resin of the phenol-formaldehyde type, first developed in Germany) and it is more complete and specific than its predecessor. Contains complete data on the chemical resistance to a large number of acids, bases and solvents; contains a large number of illustrations showing chemical operating equipment of various sizes and shapes protected with Haveg; describes fittings, screens, filter press plates and frames protected; describes "Havegit" cold setting acid proof cement. Every operating official will find the booklet instructive.

Chemical Industries,
25 Spruce Street, New York City.

I would like to receive the following booklets; specify by number, viz. C30; C31, etc...............................

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Name..............................
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C. Dec.

Chemical Production

A digest of plant management, design, equipment and containers for the makers of chemicals.

Developing Spanish Potash

Operation of the Catalonian Concessions

Amid the wide area of the potash deposits in Catalonia, Spain, the concession operated by the Potasas Ibericas S. A. is in the neighborhood of the town of Sallent, 45 miles from Barcelona, on the banks of the river Llobregat. The potash formation exists throughout the area covered by the concession, and the following information, gained when the first borings were made in 1930 and 1931, was confirmed during the sinking of the shafts and the operating of the potash deposits.

The depths at which the beds occur is comparatively high, and varies from 820 feet to 1,300 feet. The upper part of the formation contains several seams of carnallite, at least two of which are from 7 feet to 15 feet thick and can be very easily mined. They contain an average percentage of 14.5 of K_2O. The lower part contains two seams of sylvinite, one of which is 13 feet thick and of an average percentage of 26 of K_2O. The other is thinner (5 feet) but exceptionally rich, containing 38 per cent. to 40 per cent. K_2O. This seam contains strata of pure sylvinite (56 per cent. K_2O), which is easily separated by selective mining. The above seams are of such extent that, with a daily removal of 1,200 tons, production is assured for five centuries.

For the present the Potasas Ibericas Co. contemplates working only the sylvinite seams, which are the easiest to enrich and which should suffice for more than 100 years. They contain a very small proportion of impurities, and the chief seams show on analysis less than 1 per cent. of clay.

The sinking of No. 1 shaft began in July, 1931, and was finished in July of the following year; it is 985 feet deep and 14½ feet in diameter, and is equipped with a 142-feet tipple of massive concrete construction and 800 h. p. electric winding gear. Elevation is carried out by cages carrying 5,000 lb. net weight, the installation guaranteeing the raising of 150 tons per hour. Preparations have been made for the future substitution of skip elevation, which would increase production to 300 tons per hour. No. 2 shaft is being sunk, and will be 1,100 feet deep.

Since operations were commenced in October, 1932, more than three miles of galleries have been completed. From 12 to 16 stopes are being operated simultaneously, and this number can be easily increased.

At the pit-head automatic equipment sends the potash salts into the grinding and grading plants, a concrete building six stories high. Simple lay-out between grinding and grading permits of the production of the various qualities of potash salts efficiently graded.

The warehouse, parabolic in shape, is a large concrete building 97 feet wide, 65 feet high, and 400 feet long. On leaving the grading plant, the potash salts are sent through an underground passage, and by means of an elevator to a conveyor operating the full length of the warehouse, where they are sorted according to test. This warehouse has a capacity of 25,000 tons, and a scraping device removes the stored potash from the warehouse and distributes it on to conveyors, whence it is tipped directly into railway wagons.

Actual mining began on October 12th, 1932, *i. e.*, fifteen months after the ground had first been broken for the sinking of No. 1 shaft. Production, which started at 300 tons per day, reached 500 tons in December, 1932, and now approximates to 1,000 tons per day.

During the first period Potasas Ibericas S. A., profiting by the high average content of K_2O in the natural product, was able to produce all the commercial qualities by sorting without resorting to any special treatment of the sylvinite. In order, however, to increase its production of high-grade salts, the company is at present building a refinery equipped to treat 50 tons of ore per hour. This will be in operation early in August, 1934. A plant for mixing and bagging is being constructed to complete the equipment.

The second shaft, which is also 14½ feet in diameter, will be finished by the beginning of December next. It will be used primarily for ventilation purposes, and to facilitate the lowering of timber and other materials, thus relieving No. 1 shaft and enabling increased production to be carried out in the latter.

The installation of Potasas Ibericas S. A. has been designed with great care, and has many technical novelties. The concrete buildings, especially the tipple and the warehouse, are of bold and original conception and are wisely designed.

The mine is connected by a private siding with the railway leading to the port of Barcelona. Negotiations with the authorities, now pending, will give the company a private wharf on the dock of Morrot. This dock, situated at the entrance of the port, has free access, and, as its depth of water is 31½ feet, it will accommodate the largest steamers. As soon as the concession is granted, Potasas Ibericas will build on this wharf a warehouse equipped with the latest modern improvements permitting the handling of potash and the loading of steamers in minimum time. At present the company uses the services of an important stevedoring organization in Barcelona, which provides several sheds at the Espana wharf. The capacity of these warehouses is 10,000 tons.—*The Fertilizer Feeding Stuffs and Farm Supplies Journal* (London) Vol. xviii, No. 22.

Heavy Chemicals

Sulfur Recovery in Power Plants

Chemists and engineers are now turning attention to the problem of sulfur recovery in power station operation says *Chemical Age* (London) editorially. For several years sulfur recovery in gas plants and by-product coke ovens has received close study and, generally speaking, satisfactory methods have been evolved to cope with this nuisance problem in a highly efficient economical way. Editorial reports that at a power plant at Battersea the whole volume of combustion gases is scrubbed with a very large quantity of warm water which amounts to about 20 tons per tons of coal burnt (with the low sulfur content of under 1%), followed by a final treatment with alkali such as lime or chalk mixed with water, thereby removing from 90 to 95% of the sulfur. Iron is present to catalyze reaction of SO_2 with oxygen. Water spray is removed from the gases and preheated air is added to remove any possibility of the formation of rain at the chimney. All the scrubbing water together with sludge is discharged into the Thames. Clearly the process is not only unremunerative but recovers none of the sulfur removed from the gases.

An American process originated by a Professor Johnstone uses 0.025% of a manganese salt in washing water as catalyst for SO_2 to SO_3 reaction. Here water is not run to waste but is constantly recirculated, and up to 95% of sulfur can be removed by the use of only 1¼ tons of water. An important part of the process is that sulfuric is recovered at 35% strength. A 3rd (British) process also used on a works scale is that in which gases are washed with milk of lime in a standard form of gas washer, 90% of the sulfur and most of the dust being removed. Washer is so operated that milk of lime is completely used up by time it reaches the effluent end of the washer. Addition of a little fresh lime causes rapid precipitation of the sludge, which can be continuously discharged from the washer. Washed gas passes to the chimney after heat interchange with the incoming hot flue gases. Clear water can be used over again for making the milk of lime; sludge can be worked up for recovery of sulfur present as sulfate and sulfite by calcination, sulfur radical being converted into sulfuric or sulfate of ammonia.

New Hydrocyanic Acid Process

I. C. I. British Patent (395,761) deals with hydrocyanic acid production made by reacting 97-98% sodium cyanide with sodium acid sulfate, of which 75% passes an 80-mesh sieve, in presence of water equal to 3.67 times amount of sodium cyanide.

Patents—Chemical

True sulfonic acids of organic and of non-aromatic organic compounds. No. 1,931,491. Hans Haussman, to I. G. F., Frankfort, Germany.

Hydrogen production, by catalytic thermal splitting of a hydrocarbon at 1200°-1250° C. No. 1,931,492. William Hennicke, to I. G. F., Frankfort, Germany.

Completing oxidation of difficultly volatile hydrocarbons, for alcohol, by use of certain organic acids. No. 1,931,501. Martin Luther & W. Dietrich, to I. G. F., Frankfort, Germany.

Chemical and thermal alkali process for the manufacture of alumina. No. 1,931,515. H. Speckter, F. Rossteutscher & K. Rosenberger, to I. G. F., Frankfort, Germany.

De-hydrating process for recovery of calcium hypochlorite. No. 1,931,622. H. Reitz & H. Ehlers, Germany, to Pen-Chlor, Inc., Philadelphia.

The making of chlorinated derivatives of indanthrene substances. No. 1,931,646. J. H. Crowell, to National Aniline Co., N. Y. City.

The synthetic production of compounds in cyclic system, under chemical catalyst and pressure. No. 1,931,678. Frank Porter, to Atmospheric Nitrogen Corp., N. Y. City.

Improvement in calcining, in the production of titanium dioxide. No. 1,931,682. Herbert L. Rhodes, to The Glidden Co., Cleveland.

Sulfuric ester production from nitrogen-containing compounds. No. 1,931,806. H. Ulrich & P. Koerding, to I. G. F., Frankfort, Germany.

Dyestuff intermediates of the carbazole-3.6-disulfonic acids series. No. 1,931,826. F. Muth & A. Schmeltzer, Elberfeld, to General Aniline Works, N. Y. City.

Sulfur dioxide esterification of polymeric carbohydrates. No. 1,931,832. A. Schmidt, G. Balle & H. Lange, to I. G. F., Frankfort, Germany.

Catalytic hydrogenation of unsaturated non-nitrogenous compounds. No. 1,931,846. A. O. Jaeger, to The Selden Co., Pittsburgh.

Sulfuric acid esters of alcohols, and their derivatives. No. 1,931,962. Karl Marx & M. Quaedvlieg, to I. G. F., Frankfort, Germany.

Process, with reagent solution to form precipitate, for actuating water softeners. No. 1,931,968. O. R. Sweeney, Iowa, & T. B. Clark, Ill., to The Permutit Co.

Trimethylol ethyl methane trinitrate coating material for explosives. No. 1,932,050. Charles P. Spaeth, to du Pont Co., Wilmington, Del.

Caustic soda-heat process for recovering titanium dioxide. No. 1,932,087. H. W. Richter, Elizabeth, N. J.

Fine material with polymerized chloroprene to form abrasive article. No. 1,932,104. S. F. Hepp, Hamburg, N. Y.

Artificial gypsite from calcined gypsum, clay and a deliquescent. No. 1,932,120. C. K. Roos & R. Ericson, to U. S. Gypsum Co., Chicago.

Orthophosphoric acid compounds from menthol, and its purification. Nos. 1,932,130-1. J. W. Blagden, W. E. Huggett & Howards & Son, Ilford, Eng.

Sulfuric acid derivatives of amides. No. 1,932,176. F. Guenther, F. Muenz & H. Haussmann, to I. G. F., Frankfort, Germany.

Sulfonated carboxylic amide. Nos. 1,932,177-8. F. Guenther & H. Haussmann, to I. G. F., Frankfort.

Process for producing carboxylic arylides with H_2SO_4 derivatives. No. 1,932,179. Fritz Guenther, F. Muenz & H. Haussmann, to I. G. F., Frankfort, Germany.

The production of amides, sulfuric, of at least 8 carbon atoms. No. 1,932,180. Fritz Guenther, F. Muenz & H. Haussmann, to I. G. F., Frankfort, Germany.

Non-acidic reactions on pineoil to separate certain components. No. 1,932,183. I. W. Humphrey, to Hercules Powder Co., Wilmington, Del.

Catalytic reactions for the synthetic production of ammonia. No. 1,932,247. W. H. Kniskern, to Atmospheric Nitrogen Corp., Solvay, N. Y.

Phenyl substituted fatty acid esters of amino-alcohols, of strong antispasmodic action. No. 1,932,341. M. Guggenheim, Basel, to Hoffmann-LaRoche Inc., Nutley, N. J.

Purifying crude hydrocarbons from sulfur. No. 1,932,369. F. W. Guthke, to I. G. F., Frankfort, Germany.

Chemical salts from treated dehydrated ammonium salts. No. 1,932,434. J. A. Wyler, to Trojan Powder Co., N. Y. City.

Chlorine treatment of heated aluminum-nitrate-potassium mass for production of potassium nitrate. No. 1,932,587. Paul Hofer, Berlin, Germany.

Method of producing brominated organic compounds. No. 1,932,590. O. Kaselitz, Berlin, Germany.

Adhesive material of acidified and creamed latex, casein, glue, gelatin, corn gluten or egg albumen. No. 1,932,632. J. McGavack and A. A. Nikitin, to Naugatuck Chem. Co., Naugatuck, Conn.

Process for emulsifiable materials, wax-like, of sodium carbonate, spermaceti, cetyl alcohol and stearic acid. No. 1,932,643. W. Schrauth, Germany, to Un. Chem. Handels, Zurich.

Fainaceous protein material and green soap as asphalt emulsifier. No. 1,932,648. Kenneth Taylor, to Standard Oil Co., Chicago.

Lead salt of non-soap forming fatty acid in preparing surfaces for metal and metal alloy coating. No. 1,932,713. F. H. Snyder and S. F. M. Maclaren, to Industrial Research, L'td, Niagara Falls, Ont.

Process for propionic and acetic acids. No. 1,932,755. H. R. Stiles and P. W. Wilson, to Commercial Solvents Corp., Terre Haute, Ind.

Removal of hydrogen sulfide and ammonia from gases. No. 1,932,820. C. J. Hansen, Essen, to The Koppers Co., Pittsburgh, Pa.

Commercial adsorbent silica substantially dissolving metallic oxides, as decolorizing, purifying and adsorbing agent. No. 1,932,832. J. W. Turrentine, Washington, D. C.

Plant juice and extract purifier through action of pectic enzymes. No. 1,932,833. J. J. Willaman & Z. I. Kertesz, to Rohm & Haas, Philadelphia.

Aluminum alloys. Chemical-metallic alloys with manganese, calcium, silicon, cobalt, nickel, zinc, chromium, copper, bismuth, molybdenum, titanium, tungsten, vanadium and zirconium, characterized by high physical and tensile properties. Nos. 1,932,834 to 1,932,873 (40). Variously to W. A. Dean & L. W. Kempf, Robert T. Wood, L. J. Weber, all assigned to Aluminum Co. of America, Pittsburgh.

Halogen derivative of benzyl alcohol, with antiseptic, anaesthetic and antispasmodic properties. No. 1,932,886. F. Dunning, to Hynson, Westcott & Dunning, Inc., Baltimore.

Preparation of aminoalkyl-sulfonic acids. No. 1,932 907. O. Nicodemus & W. Schmidt, Germany, to I. G. F., Frankfort, Germany.

Barium carbonate friction material for brake lining. No. 1,932,912. A. Rosner, to Bendix Brake Co., South Bend, Ind.

Process for production of keto-derivatives of cholanic acid. No. 1,933,003. F. Boedecker, G. Reverey & H. Volk, Tempelhoef, Germany.

Polymerization products of aliphatic acrylic compounds with a mono-vinyl compound. No. 1,933,052. H. Fikentscher & W. Wolff, Mannheim, to I. G. F., Frankfort, Germany.

Furfural's effects on unsaturated hydrocarbon distillates under solvent, in creating synthetic resin. Nos. 1,933,715-716. R. B. Day, to Universal Oil Products Co., Chicago.

Refining isopropyl alcohol from olefines, by absorption in sulfuric acid. No. 1,933,505. S. R. Merley, to Doherty Research Co., N. Y. City.

Production of butyl and isopropyl alcohols. No. 1,933,683. S. C. Prescott, Brookline, Mass., and K. Morikawa, Japan.

Simultaneous and continuous de-hydration and rectification of raw ethyl alcohol. No. 1,935,529. O. von Keussler and D. Peters, Darmstadt.

Manufacture and stabilization of aromatic alcohols. No. 1,933,064. L. P. Kyrides, to Monsanto Chem. Co., St. Louis.

Waterglass-kieselguhr catalyst carrier for making of sulfuric anhydride. No. 1,933,067. L. F. Nickell, to Monsanto Chem. Co., St. Louis.

Process for production of sulfonic acids from waste sludges of animal, vegetable and mineral oils, and distillation products of coal and slate. No. 1,933,070. S. Pilat & J. Sereda, Lwow, Poland.

Catalyst carrier of porous silica with greater resistance than kieselguhr, to abrasion. No. 1,933,091. J. A. Bertsch, to Monsanto Chem. Co., St. Louis.

Process for manufacture of diphenyl-formamidines and catalyst for formic acid and benzene series amine. No. 1,933,206. T. Birchall & E. H. Rodd, to Imperial Chem. Industries, England.

Converting secondary alcohol into corresponding ketone. No. 1,933,215. C. O. Henke, to Du Pont & Co., Wilmington, Del.

The preparation of diaminodiphenyl-disulfides. No. 1,933,217. R. Lantz, to S'te Anonyme Des Matieres Colorantes & Produits Chimiques, Paris.

Chemical and physical processes for recovery of pulp from waste paper. Nos. 1,933,227-8. F. H. Snyder & S. F. M. Maclaren, to Industrial Research Limited, Niagara Falls, Ontario.

Anodic bath for aluminum, of ammonium phosphate and vanadate. No. 1,933,301. R. Auerbach, Berlin, to General Electric Co., Schenectady, N. Y.

Fabric impregnated with cadmium acetate, as a tarnishproof cloth. No. 1,933,302. W. G. Aurand, to R.Wallace & Sons Mfg. Co., Wallingford, Conn.

Electroplating tantalum by fusing bath of alkali halide compounds carrying ionized tantalum. No. 1,933,319. F. H. Driggs & W. C. Lilliendahl, to Westinghouse Lamp Co.

Manufacture of potassium carbonate. No. 1,933,452. F. Rusberg, to Kali-Chemie, Berlin.

Chlorine method of producing anhydrous magnesium chloride. No. 1,933,499. W. Moschel, Germany, to Magnesium Devel. Corp., Delaware.

Sodium bichromate-sulfuric acid manufacture of para-oxocamphor. No. 1,933,642. Tamura, Kihara, Asahina and Ishidate, Japan.

Powdered white lead sulfates containing lead oxides. No. 1,933,750. S. Negishi, to Empun Toro. K. K., Kyoto, Japan.

Process for preparing para-hydroxy-phenyl-glycine. No. 1,933,799. F. A. Gillice, to Eastman Kodak Co., Rochester, N. Y.

Use of soluble silver salt and silver nitrate in regeneration of photographic developers. No. 1,933,804. K. C. D. Hickman & W. J. Weyerts, to Eastman Kodak Co., Rochester, N. Y.

Production of fenchone by the dehydrogenation of fenchyl alcohol. No. 1,933,939. L. T. Smith, to Hercules Powder Co., Wilmington, Del.

Arylene preservative and vulcanizing agent for incorporating with rubber. No. 1,933,962. Bogemann, Kreuter and Weigel, to I. G. F., Frankfort, Germany.

Stable aqueous emulsions of lecithin and oil. No. 1,934,005. B. Rewald, to Hanseatische Muhlenwerke A. G., Hamburg.

Compound of the aroyl-o-benzoic acid series. No. 1,934,033. H. A. Bruson, to Resinous Products & Chemical Co., Philadelphia.

Oil for lubricating or for textile or leather treatment—fatty acid tri-glycerides. No. 1,934,100. C. Stiepel, to Un. Chem. Handels, Zurich.

Method of preparing zinc phthalate. No. 1,934,171. L. C. Daniels, to The Selden Co., Pittsburgh.

High gelatinating colloidal compound. No. 1,934,267. L. H. Heyl, to Wyodak Chem. Co., Cuyahoga H'ts, Ohio.

Peptizing hydrosols of zirconium in colloidal masses by tantalic acid. No. 1,934,294. J. L. Brown, Catonsville, Md.

Compounds of polymerized vinyl esters and fatty oils. No. 1,934,297. Eibner, Herrmann, Haehnel and Miller, to Elektrochemische Industrie, Bavaria.

Isometric furfural glycerols, as cyclic acetals. No. 1,934,309. K. R. Hoover, Chicago, to Ass'n of Soap & Glycerine Producers, N. Y. City.

Process of producing hydrogen cyanide. No. 1,934,610. T. S. Wheeler, to Imperial Chemical Industries, London.

Acrylic esters from beta-chloropropionic esters. No. 1,934,613. B. Jacobi and H. Fikentscher, to I. G. F., Frankfort, Germany.

Dispersing agent and caustic alkali use in making polysulfide solutions. No. 1,934,626. A. Nagelvoort, to Delaware Chemical Co., Wilmington, Del.

In making an aliphatic acid, the oxidation of alcohols by a fused mixture of sodium and potassium hydroxides. No. 1,934,648. C. J. Strosacker, C. C. Kennedy and E. L. Pelton, to The Dow Chemical Co., Midland, Mich.

Treatment of residual liquors to remove volatile sodium sulfide. No. 1,934,-655. L. Bradley and E. P. McKeefe, to Bradley-McKeefe Corp., N. Y. City.

Solid gel fuel of monohydric alcohol and nitrocellulose. No. 1,934,725. J. W. McBain, Stanford University, to S. Sternau & Co., N. Y. City.

Tanning and weighting agents, titanium sulfuric acid compounds. No. 1,934,773. L. Teichmann and F. Specht, to I. G. F., Germany.

Oxidizing catalyst, ferric hydroxide and chromic acid. No. 1,934,795. J. C. W. Frazer, Baltimore.

Double compounds of calcium cyanide and ammonia. No. 1,934,823. Schumann, Fick and Oberreit, Germany, to I. G. F., Frankfort, Germany.

For hydrocyanic acid. No. 1,934,838. L. Andrussow, to I. G. F., Frankfort, Germany.

Firm fuel-insoluble nitrocellulose in monohydric alcohol. No. 1,934,860. Grinnell Jones and A. F. York, to S. Sternau & Co., N. Y. City.

Interacting chlorine with antimony trifluoride to manufacture SbF_3Cl_2. No. 1,934,943. R. R. McNary, to Frigidaire, Corp.

Catalytic oxidation of organic products. No. 1,935,054. A. O. Jaeger, to The Selden Co., Pittsburgh, Pa.

For the manufacture of alkaline dichromates. No. 1,935,082. J. E. Demant, to Bozel-Maletra S'te de Produits Chimiques, Paris.

Methods of making gels. Nos. 1,935,176-178. G. C. Connelly, to The Silica Gel Corp., Baltimore, Md.

Reactions between reactant and metal compound as process of preparing catalytic masses. No. 1,935,177. G. C. Connelly & J. A. Pierce, to The Silica Gel Corp., Baltimore, Md.

Method of preparing catalytic gels. No. 1,935,188. M. Latshaw and W. L. Judefind, to The Silica Gel Corp., Baltimore, Md.

Soaps and/or aliphatic ammonia derivative of one hydroxy alkyl group, for cleansing textile fibers. No. 1,935,218. H. Ulrich & C. Schuster, to General Aniline Works, N. Y.

Improving properties of rubber by treatment with reaction product of a ketone and a di-diaryl dialkyl methane. No. 1,925,279. W. Peter Horst, Akron, to Naugatuck Chem. Co., Naugatuck, Conn.

Production of bisulfite liquor and cooling carbon dioxide formed. No. 1,935,-381. Sigmund Wang, Hawkesbury, Ont.

Cementing composition of blood albumin, formaldehyde, ammonia and cobalt oxide. No. 1,935,434. A. Cohen, to General Electric Co., Schenectady, N. Y.

By-products of petroleum refineries for making synthetic ammonia. No. 1,935,469. Carleton Ellis, to Ellis-Foster Co., Montclair, N. J.

Preparation of alkali phosphates. No. 1,935,474. O. Laubi, to Bozel-Maletra S'te Indus. de Produits Chimiques, Paris.

Arylides of 2.3-hydroxy-naphthoic acid. No. 1,935,554. E. F. Grether and L. E. Mills, to The Dow Chem. Co., Midland, Mich.

Processes for production, handling and use of commercial sodium phosphate. No. 1,935,575. L. Neuberg, to The Warner Chem. Co., N. Y. City.

Low viscosity lubricating compound of penetrative character. No. 1,935,-588. Samuel Cabot, to Polygon Products Co., Boston.

Aqueous solution of tri-sodium phosphate for retarding decay on fruits and vegetables after harvesting. No. 1,935,599. H. F. Rippey, to Laucks Laboratories, Seattle, Wash.

Process for vinyl chloride. No. 1,934,324. G. A. Perkins, West Va., to Carbide & Carbon Chem. Corp., N. Y. City.

Urea-aldehyde moldable composition. No. 1,935,411. F. Pollak and W. Kraus, Vienna, to Synthetic Plastics Co., Inc., N. Y. City.

Vinyl resin from polymerizing vinyl chloride with vinyl ester of a lower fatty acid. No. 1,935,577. Application May 1928. E. W. Reid, Pittsburgh, to Carbide & Carbon Chem. Corp., N. Y. City.

Synthetic resin from fatty oils and certain reagents. No. 1,932,688. M. M. Brubaker, to E. I. du Pont Co., Wilmington, Del.

Synthetic acyl benzoicacids, variations in heat reactions from the Friedel & Kraft synthesis. No. 1,933,375. B. H. Jacobsen, to Calco Chem. Co., Bound Brook, N. J.

Plant Operation

Hydrogen Sulfide and Carbon Monoxide Hazards

British Home Office has refused to recommend poisoning by either hydrogen sulfide or carbon monoxide should be scheduled under Workmen's Compensation Act.

Association of British Chemical Manufacturers report that statistics collected did not indicate among workmen liable to encounter CO there was any excess of illness of a kind which this gas has been said to produce (apart from cases of accidental gassing). Evidence indicated that the not infrequent cases of acute poisoning by CO, whether severe or slight, are widely recognized and regarded as gassing accidents. Most of these cases involve little or no loss of time; and only small proportion result in disablement for more than 3 days. Records of subsequent health of men affected did not point to mental impairment or pneumonia. Medical evidence was that chronic CO poisoning does not exist; that symptoms associated with relatively slight gassing cases are dyspnoea, headache, dizziness, palpitation, and a sense of fatigue; and that where pneumonia results from gassing by CO, it is due not to direct effects of the gas but to exposure of the patient to cold at the time of or immediately. Complete report available—H. M. Stationary Office, London, 6d.

Plant Equipment

Action of Hydrogen on Plant

Action on steel of hydrogen at pressures of 200-250 atm., and temperatures up to 500° C., are described by N. P. Inglis and W. Andrews before the Iron and Steel Institute at Sheffield (Eng.). At high pressures hydrogen attacks steel at much lower temperatures than those causing attack at normal pressure. In 1st stage steel absorbs hydrogen, embrittlement being thus caused even though no decarbonization or disintegration has occurred. At this stage steel can be restored to its original state of ductility by a suitable heat treatment to drive off the hydrogen. In later stages the steel becomes decarbonized and fissured, with severe loss in strength and ductility. Factors which determine the attack are the temperature, pressure, stress, and composition and structure of the steel.

In any 1 steel critical conditions giving rise to attack vary according to structural condition of the steel—that is, the heat treatment. For any 1 steel the best structural condition is that in which the grain size is small. In general, the hardened and tempered condition is recommended. Limiting temperature giving rise to attack on mild steel may vary 50° to 100° C., according to precise structural condition. A large thick-walled vessel, in which the desirable structural condition cannot be obtained, may be attacked at temperatures as low as 200° C., though smaller vessels in the same composition can be heat-treated to give satisfactory resistance at that temperature.

Alloy steels in general use for engineering purposes, such as nickel-chromium, nickel-chromium-molybdenum, chromium-vanadium, and chromium-molybdenum, are superior in resistance to mild steel. Difference in structure between large and small vessels, after heat treatment, is much less than with mild steels, since alloy steels are more responsive to heat treatment. In the properly heat-treated condition, limiting temperature causing attack of these steels at 250 atm. is between 300° and 350° C. Variations in structure in a tube or vessel have important effects. Thus even a light sealing weld may alter the structural condition of the steel in its immediate neighborhood to such an extent that attack will occur there under conditions that do not cause attack of the remainder of the steel. Such parts must therefore be heat-treated after welding.

Additions of chromium to steel progressively improve the resistance to a tack by hydrogen. Thus a 3 per cent. chromium steel at 250 atm. is resistant up to 400° C., though it is appreciably attacked at 450°, while a 6 per cent. chromium steel is resistant up to at least 500° C. Chromium-nickel austenitic steels are not disintegrated by hydrogen at 250 atm. and temperatures up to 450° C., but they absorb large quantities of hydrogen under such conditions, and consequently suffer severe embrittlement. They also undergo the familiar "boundary carbide" precipitation under these conditions.

Coal Tar Chemicals

Hydrogenation Catalysts

Relation of catalysts to hydrogenation is 1 upon which little information is available. For some years, Canadian Dept. of Mines has been carrying out small-scale tests on the hydrogenation of bitumen and the report, just published, includes some interesting notes on the use and effect of different catalysts. Reaction bomb, into which the hydrogen was forced, was made of chrome-nickel steel with ⅝ in. walls, capacity being 920 cc. Bomb was fitted with a paddle rotating at 24 r.p.m., and was electrically-heated externally to 410 ° C. Charge of bitumen was 200 grm., initial pressure 1,470 lb. per sq. in. and duration 30 min. Type of catalyst, yield of gasoline obtained by distillation at 410° F. of the liquid product from the bomb, and the yield of coke or solid residue, are given in the table below:

Catalyst	*Amount of Catalyst (in weight per cent. of charge)*	*Gasoline (as weight per cent. of charge)*	*Coke (as weight per cent. of charge)*
Nickel carbonate	3.6	17.3	12.7
Copper oxide	2.9	15.7	15.4
Ammonium molybdate	3.3	17.2	15.6
Tin	3.4	15.1	16.2
Zinc oxide	3.0	22.3	26.4
Chromic oxide	5.0	23.5	28.4
Iron oxide	5.0	14.1	37.7
No catalyst	...	14.5	13.9

Catalysts studied did not cause the removal of sulfur as hydrogen sulfide. Carbon formation was greatest in the case of iron oxide and least in the case of nickel carbonate.

Patents—Coal Tar

Removal of pure phenol from tars or tar-oils. No. 1,934,861. J. Karpati & M. G. Hubsch, Budapest.

Dephenolizing liquid hydrocarbons by formic acid. No. 1,934,007. H. Roos & E. Schwamberger, to I. G. F., Frankfort, Germany.

Preparation of acylated phenols. No. 1,933,975. H. L. J. Haller & P. S. Schaffer, Washington D. C., to the Free Use of the Public.

Resinous condensation product of a phenol and a ketonic, monobasic acid—being free of esterified phenol. No. 1,934,032. H. A. Bruson, to Resinous Products & Chem. Co., Philadelphia.

Method for chloro-aromatic amines. No. 1,935,515. L. E. Mills, to The Dow Chem. Co., Midland, Mich.

Sulfonated aromatic carboxylic acid esters and process. No. 1,935,264. F. Felix and O. Albrecht, to Soc. of Chem. Industry, Basel, Switzerland.

Aromatic amines from benzene phenols. No. 1,935,209. P. Herold & F. Reubold, to I. G. F., Frankfort, Germany.

Sulfuric acid-nitrogen oxide purification of crude hydrocarbons. No. 1,935,-207. M. Harder & W. Dietrich, to I. G. F., Frankfort, Germany.

Monazo dyestuff application on specific formula. No. 1,935,205. G. H. Ellis, England, to Celanese Corp., N. Y. City.

Fast red to blue to black water-insoluble azo-dyestuffs, and fiber. No. 1,934,807. L. Laska and A. Zitscher, Germany, to General Aniline Works, N. Y.

For fast color reserves under ground dyeings. No. 1,934,789. Brandt, Gubler and Tschan, to Durand & Huguenin, Basel, Switzerland.

Insoluble azo dyestuffs, red to bluish powders. No. 1,932,773. Adele Sohst, Adm., Germany, to General Aniline Works, N. Y. City.

High affinity saffranine dyestuffs, clear red to yellow. No. 1,934,771. J. Rosenbach and W. Lassmann, Germany, to General Aniline Works, N. Y. City.

Safranine dyestuff intermediates. No. 1,934,727. W. C. Meuly, to Du Pont Co., Wilmington, Del.

Method of preparing tetrachlorobenzene. No. 1,934,675. L. E. Mills, to The Dow Chemical Co., Midland, Mich.

Ethylene, vinylene, phenylene and napthalene group carbocyanine dyes. Nos. 1,934,657-8-9. L. G. S. Brooker, to Eastman Kodak Co., Rochester, N. Y.

Method of making hydroquinone. No. 1,934,656. E. C. Britton, S. L. Bass and N. Elliott, to The Dow Chemical Co., Midland, Mich.

Recovery of 2-methyl-benzanthrone, from crude mixture with isomers. No. 1,934,221. A. J. Wuertz, to Du Pont Co., Wilmington, Del.

Sulfonation of beta-naphthol. No. 1,934,216. J. M. Tinker and V. A. Hansen, to Du Pont Co., Wilmington, Del.

Sulfaminic acids of aminoanthrahydroquinone sulfuric acid esters. No. 1,934,143. Roger Ratti, to Durand & Hugenin, Basel, Switzerland.

Water soluble derivatives of indigoid dyestuffs. No. 1,933,993. W. Meig and R. M. Heidenreich, Germany, to General Aniline Works, N. Y. City.

The making of 1.6-dibromo-2-hydroxy-naphthalene-3-carboxylic acid. No. 1,933,987. Laska and Wollemann, Germany, to General Aniline Works, N. Y. City.

Sulfamic acids of secondary bases, deriving pure secondary bases. No. 1,933,985. Kranzlein, Greune, Thiele and Helwert, Frankfort, to General Aniline Works, N. Y. City.

Alkyl derivatives of methyl ethers of cresols. No. 1,933,775. A. E. Tschitschibabin, Paris, to Schering-Kahlbaum A. G., Berlin.

Urea-cresol disinfectant. No. 1,933,757. Hans Priewe, to Schering-Kahlbaum A. G., Berlin.

Crystalline purification of tetranitrate, from nitrobenzene. No. 1,933,754 T. R. Paterson, to Imperial Chem. Industries, London.

Azo dyes for regenerated cellulose and their production. No. 1,933,585. R. Brightman & W. L. B. Wellacott, to Imperial Chem. Industries, England.

Cotton dyestuff of the anthanthrone series. No. 1,931,821. R. Heidenreich, Germany, to General Aniline Works, N. Y. City.

Water soluble azodyestuffs. No. 1,931,836. Rudolf Bauer, Cologne, to General Aniline Works, N. Y. City.

Condensation process for manufacturing benzanthrone from impure phthalic anhydride and benzol. No. 1,931,847. A. O. Jaeger & L. C. Daniels, to The Selden Co., Pittsburgh.

As intermediates for azodyestuffs, hydrazine sulfonates of the diarylamine series. No. 1,932,152. A. Zitscher, W. Seidenfaden & K. Jellinek, Offenbach, to General Aniline Works, N. Y. City.

Purification process for crude benzol. No. 1,932,365. C. Krauch & M. Pier, to I. G. F., Frankfort, Germany.

Primary amino compounds of the lower aliphatic or benzene series. No. 1,932,518. Wm. J. Hale, to The Dow Chemical Co., Midland, Mich.

Sulfur precipitating material applied to coal which has later mechanical treatment with heated oil. No. 1,932,535. H. J. Rose & W. H. Hill, to The Koppers Co., Delaware.

Vivid yellow water-soluble disazo-dyestuffs. No. 1,932,577. H. Eichwede & A. Koch, Germany, to General Aniline Works, N. Y. City.

Vat dyestuffs of the dibenzpyrene-quinone series. No. 1,932,591. Kranzlein, Wolfram and Hausdorfer, Germany, to General Aniline Works, N. Y. City

Condensation products of the anthraquinone series, through potassium hydroxide-ethylalcohol. No. 1,932,594. W. Mieg and W. Trautner, Germany, to General Aniline Works, N. Y. City.

Preparation of amino ethers and derivatives. No. 1,932,653. E. C. Britton, to The Dow Chem. Co., Midland, Mich.

Water treatment under heat and pressure as method of decomposing thiocyanogen compounds. No. 1,932,819. C. J. Hansen, Essen, to The Koppers Co., Pittsburgh, Pa.

Bath of oxidizing agent and benzene-aliphatic alcohol, for dyeing of furs, hairs or feathers. No. 1,932,901. E. Lehmann & K. Bitterfield, Germany, to General Aniline Works, N. Y. City.

Vat dyestuff and aromatic sulfonic acid for aqueous fibre dye. No. 1,923,-068. J. Nuesslein, to General Aniline Works, N. Y. City.

Preparation of amino-anthraquinones. No. 1,933,236. A. J. Wuertz, to E. I. Du Pont & Co., Wilmington, Del.

Synthetic manufacture of acyl benzoic acids. No. 1,933,375. B. H. Jacobson, to Calco Chemical Co., Bound Brook, N. J.

Chlorination of naphthalene to wax consistency. No. 1,933,422. R. Engelhardt, to I. G. F., Frankfort, Germany.

Yellow-red azo-dyestuffs, water-insoluble and of good fastness to light. No. 1,933,431. F. Henle & H. Kracker, Frankfort, to General Aniline Works, N. Y. City.

Hydrogen and boron halides in the production of hydrocarbon oils. No. 1,933,434. Fritz Hoffman & C. Wulff, to I. G. F., Frankfort, Germany.

Catalytic hydrogenation by use of undistillable residue from coal, as catalyst. No. 1,933,435. Hans Kaffer, Duisburg, Germany.

Agricultural Chemicals

High-Testing Fertilizers

Granular mono-ammonium phosphate or mixed fertilizers containing it are obtained by introducing an excess of moist gaseous ammonia into a phosphoric acid solution, to which other fertilizers may have been added, heated to above 130°C., say 130-180° C., to produce a melt which will solidify on cooling and granulating the melt before or after the cooling. According to a modification, the other fertilizers are added to the melt after the treatment with ammonia, if necessary with suitable regulation of the temperature—*e. g.*, a further heating to 170-190° C. The granular monoammonium phosphate or fertilizers containing the same may subsequently be treated with moist gaseous ammonia to convert the mono- wholly or partly into the di-ammonium phosphate. The melts obtained may be cast into flat cakes or rolled by cooling rolls to flat cakes which can be ground to granules of the required size, or the melt may be broken up by being sprayed on to a rotating drum to obtain hard, uniformly spherical particles. Patented by Kali-Forschungsanstadt Gesellschaft, Berlin, Germany.

Prevention of Caking

Experiments have been carried out by the Gas Light and Coke Co., London, (England), on the crystallization of ammonium sulfate and prevention of caking during transport and storage. Presence of only 0.003% of iron in the crystallizing solution is sufficient to cause the crystals to assume a long hexagonal form instead of the usual rhombic mode. Hexagonal crystals have a much smaller area of contact and hence do not cake. Beryllium, chromium and aluminum act similarly.

New Coal Fertilizer

A German firm has acquired the sole rights to a new process for the manufacture of synthetic fertilizer from coal. It is proposed first to concentrate on the use of the new fertilizer materials as supplementary ingredients to other fertilizers, and their use will probably be restricted mainly to garden and truck-farm crops.

Patents—Agricultural Chemicals

Solidifying reaction products from nitric acid on phosphate of lime, for fertilizers. No. 1,935,528. G. Trumpler, to Lonza Elekt. und Chem. Fabr. A. G., Basel.

Fertilizer making with potassium compounds after waste liquor digestion from cellulose pulping operations, to manufacture fertilizer. No. 1,933,445. H. R. Murdock, to Champion Coated Fibre Co., Canton, N. C.

Superphosphate treated by ammoniacal solution or ammonium nitrate, in fertilizer manufacture. No. 1,931,768. H. C. Moore, to Armour Fertilizer Works, Chicago.

Mixed fertilizer from ammonium nitrate and di-ammonium phosphate. No. 1,931,819. L. Hecht, to I. G. F., Frankfort, Germany.

Halogenated bis-oxides, (hydroxy-aryl) showing disinfecting, preserving and insecticidal properties. No. 1,932,595. F. Muth and G. Wesenberg, Germany, to Winthrop Chemical Co., N. Y.

Ammonia-H_2SO_4 process in vacuo, for manufacture of ammonium sulfate. No. 1,932,674. D. Pyzel, to Shell Development Co., San Francisco.

Substantially pure inorganic nitrate from reacting liquid NO2 with solid inorganic halide. No. 1,932,939. L. Rosenstein, to Shell Development Co., San Francisco.

Insecticide, whire oil, a fish poison plant and emulsifier. No. 1,934,057 D. H. Grant, to Standard Oil Development Co., Delaware.

Process for manufacturing ammonium sulfate. No. 1,932,573. A. J. van Peski, to N. V. deB. Petroleum Maatschappij, The Hague.

Fertilizer of shreded cornstalks or plant residues mixed with pyrophoric iron, phosphate rock and water and aged. No. 1,934,707. H. L. Hartenstein, Chicago.

Thiophene and mercury seed disinfectants. Nos. 1,934,803-4. M. K. Karasch, Chicago, to Du Pont & Co., Wilmington, Del.

Bentonite-sulfur parasiticidal product. No. 1,934,989. A. S. McDaniel, to Loomis, Stump & Banks, New York.

Petroleum

Recent World Petroleum Congress Proceedings

Complete proceedings of the World Petroleum Congress, held in London, July 19-25, 1933, will be issued in 2 volumes. Vol. 1 will comprise geological and production section; Vol. II, refining, chemical and testing sections. Each volume will also contain the lectures by Sir John Cadman on "Science in the Petroleum Industry," and by J. B. Aug. Kessler on "Rationalization of the World Oil Industry," the report of the final session, and the speeches at the banquet. Special sectional volumes in paper covers will also be available. All inquiries should be addressed to the Joint Editors, World Petroleum Congress, Aldine House, Bedford st., London, W.C.2.

Patents—Petroleum

Sulfur trioxide and steam-metallic oxide treatment of hydrocarbon oils. Nos. 1,935,160-1-2. J. C. Morrell and G. Egloff, to Universal Oil Products Co., Chicago.

Gases of the ethylene series with catalyst of five optional metals, for gasolene No. 1,934,896. C. R. Wagner, to Pure Oil Co., Chicago.

The manufacture of condensation products from diolefines and hydrocarbons. No. 1,934,123. F. Hofmann and A. Michael, to I. G. F., Frankfort, Germany.

Cracking in homogeneous state, and catalytic destructive hydrogenation of heavy hydrocarbons. Nos. 1,933,507-8. E. B. Peck, to Standard Oil Development Co., N. Y. City.

Nitrogen oxide-sulfuric acid treatment of hydrocarbon oils. No. 1,933,748. J. C. Morrell to Universal Oil Products Co., Chicago.

For the destructive hydrogenation of carbonaceous materials. No. 1,933,-503. J. M. Jennings, to Standard-I. G. Co., Linden, N. J.

Treatment of alkaline wash liquors used in the refining of hydrocarbons from petroleum oils. No. 1,933,410. Blair, Melvill, Berry and Banks, Trinidad, B. W. I., to Trinidad Leaseholds, London.

Gas and vapor washing oil, solvent for sulfur compounds and hydrocarbons, in recovery from destructive hydrogenation. No. 1,933,069. M. Pier & K. Winkler, Germany, to Standard-I. G. Co., Linden, N. J.

Oxidizing paraffinic hydrocarbons in the process of producing organic acids. No. 1,932,613. C. Beck and H. Diekmann, to I. G. F., Frankfort, Germany.

Separation of organic acids from destructive distillation of paraffine wax. No. 1,931,859. Hans Beller & Martin Luther, to I. G. F., Frankfort, Germany.

Xylene-water purification of fatty acid derivatives of mineral oil. No. 1,931,855. G. Alleman, Penn., to Sun Oil Co., Philadelphia.

Hydrogen and heat treatment of solid fuels for conversion to valuable liquids. No. 1,931,549-50. Carl Krauch & M. Pier, Germany, to Standard-I. G., Co. Linden, N. J.

Plant Laboratory

Oil Emulsion Suggestions

Preparation of emulsions of ordinary oils is attended with some difficulties. Simple method is: to prepare an emulsion from a given oil using a given soap as emulsifier; start with a strong solution of the soap, such as a concentration of 40% of the fatty acids. If the soap has to be prepared it can be made at this concentration, or if already available a solution of this strength can be made. Then take in a beaker an amount of the strong soap solution equivalent, when calculated as fatty acids, to 5% of the weight of oil to be emulsified, and add a little of the oil. Stir concentrated soap solution and oil together using a flat stick. They should soon combine to a thick paste. If they fail to do this, feed in a very little water, then a little oil, and so on slowly until, when right amount of water is present, mass will show a characteristic thick consistency. It is hardly possible to describe just what takes place but it is usually obvious when mass becomes properly emulsified that some definite change has occurred. Mixture ceases to look oily.

As an example, an emulsion in the proper form at this concentrated stage may stand up as an almost solid mass; it will vibrate like a jelly when hit with the stirring stick; and may even transmit the vibration through the beaker to the hand in which it rests.

When this stage is reached rest of the oil should be added, preferably a little at a time, but no more water until all of the oil has been worked in. When adding the rest of the oil the emulsion may appear to be broken down but it should return to the quivering jelly form after each oil addition.

After completing concentrated emulsion, dilution should be started by stirring in a very little water. At 1st a thick paste will be obtained, which will thin out with successive additions and then go over to a thin milky emulsion. Results will not be stringy, pasty mixes, but thin liquids even at such concentrations as 50% oil.

Among the soaps and oils emulsified were: ammonium soap from cocoanut oil fatty acids; ammonium and potassium oleates; triethanolamine and monoethanolamine oleates; cocoa butter soap; cocoanut oil; hydrogenated cocoanut oil; Japan wax; Crisco; castor oil; blown castor oil; mineral oil; Carapa oil; olive oil. Charles F. Goldthwait (Senior Industrial Fellow, Mellon Institute), *American Dyestuff Reporter*, Oct. 9, p. 589.

Study of Metals Used in Sulfonating Plant

Behavior of metals in sulfonating plant under actual working conditions has been studied by Endicott Johnson and International Nickel. In 1 series of tests, specimens were exposed during the sulfonation of 10 batches of neatsfoot oil by a process in which 142° Tw. sulfuric was added to the oil during 1 hour, and the reaction allowed to continue for about 6 hours at a maximum temperature of 34° C. Saturated brine was then added, the mixture agitated and allowed to stand overnight, and the sulfonated oil removed. In another series of tests, castor oil was sulfonated with 168° Tw. sulfuric acid. Corrosion rates were as follows:—

	Corrosion Rates—mg. sq. dm.	
Metal	*Sulfonated Neatsfoot Oil*	*Sulfonated Castor Oil*
Lead	127	165
Chrome-nickel iron (18-8)	425	22
Nickel	30	25
Monel metal	34	11
Ni-resist	90	29
Plain cast-iron	10,000	120

New Equipment

For cooling process water Viscose Co. has purchased a 75 ton steam jet refrigeration unit from Westinghouse. Unit consists of a horizontal cold tank across the top of which is installed 3-25 ton boosters each with suction gate valves, 2 hand wheel operated and the other hydraulically operated with this booster automatic operated responsive to chilled water temperature. Three boosters exhaust into the common horizontal condenser on the far side of the cold tank having a 2-stage ejector with surface inter and after condenser. Chilled water from this unit will be delivered to a storage tank and circulated through a spray air conditioning tank and returned to the refrigeration unit which provides an average temperature of a considerable mass of water within the 2 degree limits for which the automatic control of 1 of the boosters is set.

Hypressure Jenny

Homestead Valve Mfg. Co., Coraopolis, Pa., has a new, fully automatic model of the Hypressure Jenny, their all-purpose cleaning, paint-stripping, or sterilizing machine. Kocour Co., 4724 S. Turner ave., Chicago, has a new pH control set for nickel plating solutions.

New Fertilizer Batch Mixers

To meet increasing demand in use of anhydrous ammonia, in fertilizer mixing Stedman's Foundry & Machine Works, Aurora, Ind., has perfected new line of batch mixers, designed specially for this purpose. Simplicity of design and rigidity of construction, has been retained in these new models. Both intake hopper and discharge door are provided with special running joints that prevent leakage of material, dust or gas fumes. New mixers are made in ½ ton and 1 ton sizes. They will be known as Model M, and are described in Bulletin 126 which has just been issued by the manufacturers. Company has also redesigned their Model B batch mixers, so that they are now available for use with anhydrous ammonia. These mixers are distinctive in that their large diameter (8 ft.) and very narrow width insure the most rapid and thorough mixing action. Stedman Foundry & Machine is preparing to celebrate in '34 its 100th anniversary.

Automatic Timing

G. E. has a new electric timer that lends itself to a multitude of automatic and remote-control applications. By combinations of two or more timers, or by using one in conjunction with other types of automatic time switches, it is possible to meet a wide range of process schedules. Timer, designated as Type TSA-10, is "all electric"—timing is started by closing a switch. Resetting is automatic when control circuit is deenergized. Timing period is readily adjustable over a wide range.

Firestone Steel Barrels

Firestone Steel Products (Firestone Tire & Rubber's rim and wheel plant) Akron, is now producing extensive line of stainless steel containers for food, drug, chemical, fruit juice, syrup, vinegar, soap, and other industries now using wood or steel containers. Firestone container is furnished in either double wall insulated type or a single wall design and practically any size or design is furnished from 1 gal. up in either stainless or carbon steel, according to requirements of the customer. First type company has put into production is the stainless steel beer barrel made of double walls of steel, with outer wall of heavy gauge carbon steel corrugated for strength and inner shell of smooth, sanitary, stainless steel requiring no pitching or other attention.

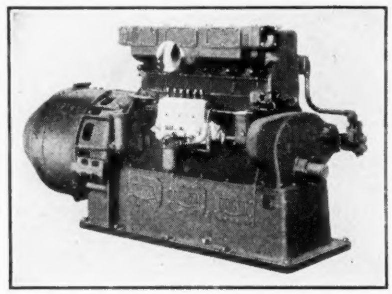
Patterson's New Agitator

Latest addition to extensive line of agitators, mixers and stirrers manufactured by Patterson Foundry & Machine is a separate agitator for all purposes. The Unipower Agitator is built in both vertical and horizontal types and, when using 1800 R.P.M. motors, will produce shaft speeds down to less than 1 revolution per minute if desired, without the use of gears.

While 1 way or 2 way agitation can be accomplished wihhout noise, vibration or grease slop of any kind, and heavy continuous loads or momentary overloads as high as 400% can be carried, unit is very compact and light, making it especially attractive for installation over tanks and vats. Unipowers are built in sizes of 40 horse-power down to fractional sizes in several frame types, and require no additional bearings or flexible couplings for installation.

Compact Generating Set

With increasing electrical power rates for power and industrial plants in many cities latest development of The Buda Co., whose works are located at Harvey, Ill., is of great interest to many manufacturers. New development is a light compact disel generating set producing current at approximately ¾ to 1c per kilowatt. These sets range in size from 10 to 90 KW, alternating anddirect current. These engines do not require the services of an attendant, only an occasional visit to the engine room, possibly 2 or 3 times a day. They are suitable for 24 hour service.



A small compact generator set fitted with a natural gas or gasoline engine of similar design has also been put on the market recently by The Buda Co., ranging from 5 to 75 KW.

Equipment Co. Personnel

Combustion Engineering has appointed James Cleary Philadelphia sales manager, with offices at 1616 Walnut st. Fred L. Farrell has been appointed Boston sales manager. G. O. French has been engaged as a sales engineer, specializing on fire-tube boilers and all special shop work on chemical equipment. O. S. Sleeper, formerly with J. P. Devine Mfg. Co., has been placed in charge of sales of the chemical equipment division of Goslin-Birmingham Co., Birmingham, Ala. William H. Allen, Jr., is representing Foster-Wheeler's interests in the Coal Process Co.

Equipment Booklets

E45. Aluminum Co. of America, Pittsburgh, Pa. A 25 page booklet on "The Riveting of Aluminum and Its Alloys," complete with engineering data.

E46. Aluminum Co. of America. "The Welding of Aluminum"—a 41-page profusely illustrated booklet complete with engineering data.

E47. Brown Instrument Co., Philadelphia. A broadside showing several letters indicating substantial savings through the use of the Brown Electric Stock Recorder.

E48. Littleford Bros., 447 E. Pearl st., Cincinnati, Ohio. A 4-page circular showing several examples of sheet or plate steel products fabricated by this company, particularly tanks for the brewing, chemical, fertilizer, glue and gelatin, oil and fat, paint, varnish and lacquer, ink, soap industries.

E49. Mishawaka Industrial Instrument Manufacturing Laboratory, Mishawaka, Ind. Two booklets describing general line of Mishawaka pyrometers.

E50. John Robertson Co., Inc., 133 Water st., Brooklyn. A 4-page circular describes the Robertson High Pressure Hydraulic Pump.

E51. Streeter-Amet Co., 4101 Ravenswood ave., Chicago. Catalog No. 1.32 describes the general line of automatic weighing devices with permanent, printed records.

E52. N. J. Zinc Co., 160 Front st., N. Y. City. Beautifully illustrated booklet showing a number of diversified uses in a wide variety of industries for zinc. "Design For Profit" is an outstanding booklet.

E53. T. Shriver & Co., Harrison, N. J. "Filter Presses For All Purposes" is a new, profusely illustrated booklet of 12 pages, and as its name implies, it is a complete resume of data on the extensive line of filter presses and diaphragm pumps manufactured by Shriver for over a quarter of a century. Every engineer and plant manager will find a copy of this booklet necessary in the plant "Five-Foot Shelf."

Chemical Industries,
25 Spruce Street,
New York City.

I would like to receive the following booklets specify by number, viz. E35; E36; etc. ....

....

Name..
Title..
Company..
Address..

Equip. Dec.

Chemical Markets & News

Chemical Alliance Code Still Unsigned—Fifth Revision Now In Hands of Membership For Approval.

Another 30 day period has come and gone and the basic code of the chemical industry remains unsigned. Code committee of the Chemical Alliance has worked feverishly to perfect a code that will meet the demands of NRA officials and yet not surrender the fundamental safeguards that they feel necessary to protect the rights of those responsible for the operation of the industry. The Alliance has distributed to the industry the 5th revision of the code. A number of signatures have already been received and as soon as this work has been completed the code will again be forwarded to Washington for approval. Articles 7, 8 and 9 of the new draft now read as follows:

Article VII

"If any employer in the chemical industry is also an employer in any other industry, the provisions of this code shall apply to and affect only that part of the business of such employer which is a part of the chemical industry.

Article VIII

"(a) Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection.

"(b) No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing.

"(c) Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President.

Article IX

"In all activities under this code, the peculiar relation of the chemical industry to national defense, national health, national industry, and national agriculture must be constantly borne in mind by its employers, stockholders, directors, executives, and employees. The present products of this industry should be regarded as only by-products; its main product and purpose the extension of chemical knowledge in the public interest. It is recognized that the chemical industry, if it is to keep abreast of chemical progress in the world, requires employees capable of constant advancement in their technical skill and of high and loyal character. Therefore, conscious of the great purpose of the industry, by presenting this code the employers in this industry shall not be deemed to have waived any of their constitutional and legal rights to engage, promote, or release employees, regardless of membership or non-membership in any organization, and the members of the industry shall not be deemed to have waived any other constitutional rights."

Dry-Color Code

Public hearing of the proposed dry-color industry code on Nov. 28 brought out such strenuous objections that the deputy administrator in charge, F. J. Patchell, requested that the members of the Dry Color Manufacturers' Association rewrite the code. Strenuous objections were raised by NRA Labor Advisor Leo Hirsch and Herbert Newman of the legal division. Prominent dry color makers present were United Color & Pigment's Joseph Mangin; Fred Somers, Lavanburg president; B. M. Van Cleve, Sherwin-Williams; I. J. Ackerman, Fine Colors; Dr. Max Marx, Max Marx Color & Pigment; G. A. McCorkle, Krebs Pigment; Arthur F. Brown, Imperial Color; and R. J. Staber, Zinsser & Co.

Public hearing of the stearic acid, oleic acid code on Nov. 27, while bringing out some differences of opinion on labor questions, did on the whole have a very harmonious appearance and Deputy Administrator Paddock will probably have very few real problems to iron out.

Remaining Public Hearings

A few public hearings of codes for various divisions of the chemical industry remain to be held. Included are: china clay on Dec. 13 at the Mayflower Hotel before Deputy Administrator Malcolm Pirnie; ball clay on Dec. 12 at the same hotel before the same deputy.

Foundation Aids

Chemical Foundation has given $105,000 aid to Savannah pine paper pulp experiment station. Georgia has leased station to Industrial Commission of Savannah until Jan. 1, 1936. Foundation head, Francis P. Garvan, at a recent meeting of the Textile Institute, reported that Dr. Herty's experimental work had progressed to the stage where fairly large quantities of suitable newsprint were being turned out. Recent supplement of the *Naval Stores Review* was printed on slash-pine paper.

On Nov. 20 the 9 leading daily Georgia newspapers issued their regular editions on Dr. Herty's Southern pine paper. To refute the charge that sulfite and pulp from Southern pine could not be run through a paper-making machine at 750 ft. or more a minute, as in the case of pulp produced from Northern spruce, pulp was shipped to a Canadian mill and the paper made for these special editions without special or unusual trouble arising.

Said Clark Howell, veteran editor and general manager of the *Atlanta Constitution*, "I was informed by the pressman that he never had a better run in his life. The paper looked fine and exceeded all expectations." Other publishers joined in praising the paper stock.

Georgia scientists report that in 12 Southern States pine trees can be grown in 10 to 13 years big enough to make all the standard newsprint U. S. needs.

Possible competition from Southern States has been recognized by Canadian newsprint circles and on Nov. 22 *The Montreal Gazette* stated in part:

"Broadly speaking, there appears general recognition of the potentialities of newsprint manufacture from Southern pine, but for the time being there are advanced by well-posted observers here a variety of factors that combine to make reasonably remote early development of serious competitive danger of the Canadian industry from that source.

"These (factors) include the fact that the newsprint paper thus far produced is substantially inferior; that it has not been

sufficiently established that costs would be very substantially below those of the Canadian producers and that mills would need to be financed requiring large amounts of capital.

"Sight should not be lost, however, of the fact that while large-scale production in the South may, and appears most likely to be, some time off, creation of even a small unit would reduce a market already inadequate for the productive capacity of the industry."*

Association News

Drug, Chemical & Allied Trades Section, N. Y. Board of Trade, is headed by Samuel W. Fraser, Burroughs, Wellcome; vice-chairman, Herman G. Weickor, Dodge & Olcott; treasurer, S. Barksdale Penick, S. B. Penick. Executive committee includes among others "Gus" Bayer, Merck; Jos. A. Huisking; A. A. Teeter, Chas. Pfizer & Co.; A. A. Wasserschied, Mallinckrodt. George Simon, Heyden, is section representative on the board. Section is now on record as opposing the "Tugwell" Bills.

"For pleasure and for profit, come to Cincinnati." That is the invitation being extended so earnestly to all members of The American Ceramic Society to attend 36th annual convention in Cincinnati, Feb. 11 to 16, 1934.

Salt Distributers' Association of America has been formed with offices in Baltimore in charge of George S. Robertson, 514 Park Bank Bldg.

Tugwell Bill Opposition

M. C. A. has entered the lists in the growing ranks of opposition to the proposed "Tugwell" Bills. At a special meeting of the executive committee, held Nov. 28 in N. Y. City, it was decided to present a brief before the Senate subcommittee. A special committee will be in charge of this work and will be joined by the Synthetic Organic Chemical Manufacturers' Association.

Philadelphia Medal Award

The John Scott Medal for scientific achievements was recently awarded by the City of Philadelphia to Dr. Frank Conrad, assistant chief engineer, Westinghouse. In 1816 John Scott, chemist of St. Patrick Square, Edinburg, Scotland, bequeathed a sum of money to the City of Philadelphia, income of which and a bronze medal was to be used as an award to scientists. Since that time 1 or more awards have been made annually.

*Pres. Roosevelt commented on pine newsprint in an interview at Warm Springs, Ga., Nov. 22. Recalling that he and Dr. Herty had discussed the problem 5 years ago, the President further remarked that "I am delighted that his dream and that of all of us has come true and that we are to use Southern pine for newsprint paper purposes."

Association Notes

N. Y. Drug & Chemical Club (downtown luncheon club of the chemical industry) has reduced initiation fee to $1.00 for a limited period. A. S. T. M. Philadelphia headquarters will move Jan. 1 to the Atlantic Bldg., 260 S. Broad st. A. C. S. President Lamb has appointed Carl S. Miner, Robert T. Baldwin, G. J. Esselen, H. G. Knight and J. M. Weiss as a committee to consider and report on the need for a code for chemists. F. C. Wolters (Consumers' Chemical) donated "Booster Prize" at Nov. 13 meeting, Chemical Club of Philadelphia.

A. S. T. M. Appoints Mougey

American Society for Testing Materials has appointed H. C. Mougey, assistant technical director and chief chemist, Research Laboratories, General Motors Corp., as the A. S. T. M. representative on the Sectional Committee on Specifications and Methods of Test for Safety Glass.

Obituaries

F. W. Allen, 57, senior member, Lee, Higginson & Co., N. Y. City bankers, died Nov. 25. He was a director of Air Reduction, Solvay American Investment, Vanadium Corp.

Albert Kingsley Church, 63, chief chemist, Lever Bros., died Nov. 18.

Other Deaths

Edward J. McCauly, 68, president, Mirabel Quicksilver, well-known in that industry for years, died Nov. 2. Louis A. Melanson, 87, known as the spruce gum king of Canada, died Nov. 6. Walter V. Smith, 65, president, Smith, Kline & French, Philadelphia, died Nov. 9. John M. Mulkey, 81, former president of both Detroit Salt and Mulky Salt, died Nov. 15. George R. Tucker, 29, research chemist for Dewey & Almy Chemical, Cambridge, died Nov. 9. T. C. Hatton, chief consulting chemist, Milwaukee Sewage Commission, died Nov. 11 following an automobile accident.

Personnel

George W. Ullman has resigned as General Printing Ink's president and is now vice-chairman of the board. Albin K. Schoepf, former board chairman, is now president. Thomas A. Lenci, former treasurer, is now board chairman and secretary. Perry D. Richards, former secretary, is executive vice-president and treasurer. A special 15c common dividend was declared together with the regular preferred.

International Selling Corp., N. Y. City importer and distributor of heavy chemicals, has elected P. D. Level, president; Other officers elected:—vice-president and treasurer, E. A. Darling; vice-president, W. E. Miller; assistant treasurer, C. Bauer, and secretary, J. C. Allain-Launay.

In New Fields of Endeavor

C. J. Merritt, Purdue, has been awarded the American Gas Association Scholarship. Earl K. Fischer (fellow at Chicago, Julius Stieglitz Fellowship) is with United Color & Pigment. William H. Horne, former du Pont experimental station research chemist, is with F. C. Huyck & Sons, Albany. A. Lloyd Taylor is now research chemist for the Girdler Corp., Louisville. Donald K. Tressler has resigned as chief chemist, Birdseye Laboratories, to head chemical division N. Y. State Agricultural Experiment Station, Geneva, N. Y. Charles W. Walton, Jr., is now a research chemist with Goodyear. A. M. Jackson has been appointed sales representative in Denver by Pure Carbonic. Warehouse is at Morris Warehouse Corp., 2161 Blake st. J. H. Wheeler has been appointed in charge of industrial chemical sales other than to paper companies by Paper Makers Chemical, Milwaukee. Edwin H. Kottnauer is representing Climax Molybdenum on the Pacific Coast with offices at 1341 S. Hope st. Los Angeles.

Julian C. Smith, former Shawinigan Water & Power vice-president, is now president. J. E. Aldred now becomes chairman of the board. Pittsburgh Plate Glass' director of research is William Waldeck. C. F. Winans is researching for National Aniline. R. C. Haring, formerly at Wisconsin, is now with National Aniline. A. H. Homeyer is on Mallinckrodt's research staff. R. W. McNamee has been stationed at Carbide's South Charleston plant. Eugene Johnson is now at the du Pont rayon plant at Waynesboro, Va. He formerly was at Washington & Lee.

Company News

American Cyanamid has acquired General Explosives, manufacturers and distributors of blasting caps, dynamite, etc., with general offices and works at Latrobe, Pa. General Explosives will be a division of American Cyanamid & Chemical, an operating subsidiary.

Du Pont is arranging a vacation plan for its wageroll employes. Plan was worked out in conjunction with various works councils of the employes and will afford vacations with pay up to 1 week as a maximum.

Rentschler Steel Chemicals, according to the recent prospectus of Barium Steel, issued when 5,000 shares of class A con-

vertible common stock were placed on the market, has been formed to buy and sell barium chemicals for the steel industry.

Marvin Wood, Brown-Edwards, Chicago general commodity brokers, has taken over a large interest since the death of the president, H. E. Hoaglund.

Atmospheric Nitrogen (Allied) has added additional ash storage to the Hopewell plant so that continuous operation during the winter is now assured. Ash is shipped by steamer from Solvay's Syracuse plant through N. Y. Barge Canal which is usually closed 6 months each year.

Turner Moves!

Joseph Turner & Co., has moved to 500 5 ave., N. Y. City, from 19 Cedar st., the original location of the firm when it was started in 1861. For years the firm was owned, managed and bore the name of the Riker family. When Joseph Turner bought out the company he changed the name.

Among the firms represented by the Turner organization are: Niagara Alkali; Oldbury Electro-Chemical, Buffalo Electro-Chemical and Colonial Salt. Company also is a large importer of industrial chemicals.

Litigation

U. S. Circuit Court of Appeals for the 2nd District after a rehearing on the so-called Flaherty lacquer patents suit of du Pont against Glidden unanimously sustained its former decision upholding the validity of the patents.

This latest decision, rendered Nov. 13, was on a petition filed by Glidden for a rehearing of the case which was decided against it by the Circuit Court of Appeals last July. At that time, the Circuit Court reversed a decision of the U. S. District Court for the Eastern District of N. Y., in which the case had 1st been heard when the du Pont company brought suit for infringement.

It is quite probable that Glidden will now move to bring the case into the U. S. Supreme Court in a final effort to reverse the decision of the Circuit Court of Appeals.*

Federal Judge Forman reserved decision Nov. 17 on a motion for an order to reopen a suit dismissed 4 years ago, purpose of which was to enforce liability against stockholders and directors of bankrupt Miner Edgar Chemical. On Dec. 18 hearings will be resumed in the suit brought by John N. Charnock, trustee in bankruptcy for Miner Edgar Chemical, to require an accounting of that concern's assets by Consolidated Chemical and the National Bank of N. J. of New Brunswick as trustee of a $1,500,000 mortgage.

*Suit ended Dec. 7, when Glidden agreed to accept license offered by Du Pont.

Final argument in United Chromium's suit against G. M.; New Departure Mfg.; and Bassick over chromium plating patents in U. S. Court for the District of Connecticut, Hartford, has been set for March 15, 1934.

Suits to protect rights on 4 patents concerning sewage systems have been filed in U. S. District Court, Philadelphia, by Dorr against Link Belt. Four separate suits were filed and in each Dorr petitioned for an injunction to restrain Link Belt from continuing alleged infringement of the 4 patents and for the recovery of all profits made by it on previous alleged violations, and also for damages. No specific amounts are claimed.

Foreign Trade

U. S. chemical foreign trade showed an improvement during 1st 9 months of 1933, with total exports of chemicals and allied products valued at $75,500,000, or 6% larger than in corresponding period of '32, and imports at $61,700,000, or 11% more. Increases were made in both quantities and values of a number of items comprising chemical exports, but some of the largest were in rosin, turpentine, pine oil, sulfur, methanol, butanol, and all classes in the coal tar group. Exports of coal tar products, amounting to $8,528,000 in the 1st 9 months of '33, equaled value for entire year '32. Of this figure, exports of benzol were valued at $927,000, crude coal tar at $1,000,000, coal tar pitch at $1,400,000, and coal tar colors, dyes, stains, and color lakes at $3,358,000.

Imports of chemicals and allied products during 3rd quarter of '33 amounted to $24,800,000, compared with $16,800,000 in 1st quarter and $20,100,000 in the 2nd quarter. Increases, especially in quantities, were made in very many of the items, largest being in coal tar colors, dyes, and stains ($4,579,000), quinine sulfate, menthol, acetic acid, white arsenic, ammonium chloride, ammonium nitrate, cobalt oxide, glycerin, crude iodine, caustic potash, potassium carbonate, sodium sulfate, sodium cyanide and lithopone. Nearly all commodities in the fertilizer group advanced. Most important gains in this group, which advanced 31% in quantity to 863,500 tons and 27% in value to $17,400,000, were: Ammonium sulfate, 278,995 tons ($4,839,700); guano, 55,000 tons ($1,012,000); potassium chloride, crude, 68,500 tons ($2,492,000); kainite, 51,200 tons ($479,000); and potassium sulfate crude, 43,660 tons ($1,683,000).

Salmon W. Wilder, Merrimac's board chairman, writes intimately of his friend and former co-worker, Henry Howard, in *I. E. C.'s* "American Contemporaries" (Nov., p. 1299).

Customs and Tariffs

Importers to the Argentine must hereafter either obtain government licenses for each shipment or risk long delay and probable failure to get exchange permits for remittances. New decree provides for issuance of exchange permits before goods are ordered abroad. Permits will only be issued as exchange is available. Carrying out slogan "Buy from those who buy from us" new decree is expected to cut American share from 12% to 7½% of the total. A few years ago it amounted to 25%.

Imported materials, intended for use in domestic manufacture of other articles, are not exempt from tariff requirements for marking with the country of origin under a ruling by the Customs Bureau. Regardless of whether such materials as yeast, tanning extract or paint are processed or manufactured abroad and are intended for further treatment in plants in this country immediate containers must bear suitable legend at time of importation, it is held. Under tariff the Secretary of the Treasury has authority to waive marking requirement in certain cases and ruling is intended to clarify a section, in the customs regulations exempting imports of crude substances of materials and containers. In explanation it is pointed out that materials intended for further processing or manufacturing are not crude and do not come within the meaning of factory supplies, which are also exempted.

Section 516 of the tariff, which provides for filing of protests by domestic interests against classification of imports may be invoked only by an American manufacturer, producer or wholesaler, it has just been decided by Customs Court, and where such an action is instituted it must be within 30 days after liquidation and against which a complaint has been rejected by the Secretary of the Treasury.

Secretary of the Treasury has found that sodium perborate from Germany is not being dumped.

Importers are seriously considering advisability of a master code. On the central committee is Charles F. Walden, American Gum Importers' Association.

Foreign Customs Notes

French import duties on certain pure fixed oils (for soaps, stearine, edible fats, paints and varnishes), on which duties were increased in August '33, were again increased Oct. 8 (French Journal Officiel Oct. 13). New duties became effective immediately, except that on corn oil for soap making, which will not become effective until a date to be announced later.

Australia has taken steps to strengthen tariff wall because of "depreciated cur-

rencies." Copies of new provisions are obtainable from Australian Customs Representative, 25 B'way., N. Y. City.

German import duty on sodium hydrosulfide has been increased from 5 reichmarks to 30 per 100 kilos, effective Nov. 22. Imports of sulfuric are restricted to a quota equal to '32 imports.

Coal tar pitch used in manufacture of coal briquettes for export has been given a drawback of duty in the U. K. for 8 months from Nov. 6.

Newfoundland has a new Fertilizer Act, fixing standards for contents and prescribing marking of packaged goods.

In New York City

Collector of Internal Revenue, 3rd district of N. Y., has moved to the 7th floor of the new U. S. Parcel Post Bldg., 341 9th ave. Telephone, Lackawanna 4-9400.

Appraiser of merchandise at N. Y. City has issued a notice of suspected dumping of Italian white titanium dioxide.

Foreign

British hope to take the important dyestuffs importing question out of the hands of the politicians by creating an impartial independent body to consider the problem. In the meantime, Import Duties Advisory Committee has recommended and Government has acccepted report prohibiting import, except under license, of dyes and intermediates. Thus importation of these products, 1st controlled in 1920, will continue under regulation in all probability. Committee has suggested, however, that colors and coloring matter should be exempt. It has also intimated, according to reports, that if the recommendation is accepted it proposes to suggest exemption from duty of dyestuffs, but not intermediates.

I. C. I. vs. I. G.

I. C. I. has lost an appeal from a decision of the English Patent Office who revoked their patent for improvements relating to vulcanization of rubber and rubber tire substances.

I. C. I. said they applied for the patent 13 days after a similar application had been made by I. G. for a similar claim. But the difference between the 2, according to I. C. I. attorney, was that while the respondents, the I. G., claimed for the process itself with the acceleration of the vulcanization, the applicants claimed for the process by its application mainly to a new group of chemicals. Examiner had held that they were the same, or substantially the same invention.

A notable indication of the growth of the Chemical Section of the British Industries Fair is given by the fact that 6 months ahead of the 1934 Fair, which opens in London on Feb. 19 and continues until March 2, chemical manufacturers had booked more exhibition space than was occupied by all exhibitors in the Chemical Section at the 1933 Fair. Heavy chemical industry had its origin 100 years ago in Great Britain and has since been conspicuous in this field of chemical production.

Zinc-white production under a British patent, of which the rights for the northern countries are held by the Swedish Company Svenska Metallverken, has been started at Koklaks, near Helsingfors, by the newly formed firm Suomen Sinkkivalko O/Y. Capacity is 1,400 tons yearly, and raw materials will be imported from England, U. S. and Poland. In 1932 Finland imported 1,242 tons of zinc-white, and in January-September this year 1,314 tons, of which 661 tons have come from Germany, 302 tons from Poland, 155 tons from England and 133 from Holland.

Merger negotiations between Courtaulds and British Enka Artificial Silk have been broken off, according to foreign report.

Germany

German I. G. has apparently gone NRA without, however, a "Blue Eagle." Reports state that working hours (formerly 48 to 56) have been dropped to 40 by going to a 5-day week. Dismissal of 12,000 people has been halted. Many employes have been pensioned before their retirement age. About 40,000,000 marks have been marked for new plants, finished materials stocks are to be increased.

First time since 1930, sales of the German Nitrate Syndicate have shown a slight increase. According to last report of Ruhrchemie A. G., conditions in the world industry have begun to improve. In so far as Germany is concerned, exports show a certain stability and amount of about 40% of total sales, while domestic consumption records an increase over last year. Total sales have advanced some 5%.

Ruhrchemie is working at 35% of capacity, against 30% in 1931-32, but net profits rose to rm. 870,000 from rm. 58,000, while expenses fell to rm. 2,070,000 from rm. 2,480,000. On account of German transfer regulations, sinking fund payments on American debts were only partially executed, arrears in transfer amounting to about $1,000,000.

German Lithopone Convention has been extended to '37. A number of new members are announced.

German Sulfate Imports

German sulfate exports during first six months of 1933 reached 188,504 metric tons, approximately 30,000 tons over corresponding period of 1932, although substantially less than the 293,000 tons exported during first half of 1930. Export volume was particularly strong in June, 1933, with a total recorded of 57,216 tons.

Principal export markets for German sulfate in early 1933 were: Japan, 64,520 tons; China, 38,649 tons; Spain, 27,088 tons; Netherlands, 22,906 tons, and Philippine Islands, 11,005 tons. Average declared value of the German exports for June, 1933, fell to an all-time low of 62.75 marks a metric ton, compared with 91.10 marks in June, 1932; 116.90 marks in June, 1931, and 202.70 marks in June, 1930.

German Heavy Chemicals

Germany's 1932 sulfuric production is estimated at 1,000,000 metric tons of monohydrate against a peak in 1929 of 1,700,000 tons. In 1930, 72 plants produced 1,468,100 tons of sulfuric from raw material, 70% of which was pyrites and 15% zinc blende. In 1931, production amounted to 1,160,000 tons in 67 plants, 42 of which were of lead-chamber equipment and the rest contact; pyrites accounted for 83% of the raw material. German superphosphate production consumes 20% of the total sulfuric production, and ammonium sulfate production takes 40%.

Soda-ash production in 1932 was estimated at 500,000-600,000 tons against a somewhat higher level in 1931, and a 1929 peak of 700,000 tons. Caustic production was estimated at 125,000 tons in 1932, against 140,000 tons in 1929 and 125,000 tons in 1931, while caustic potash output was 50,000 tons in each year. Caustic potash sales are handled by Electro-Chemical Products Co., an I. G. company in Frankfort. Same cartel is exclusive sales agent for potassium carbonate, production of which was 25,000 tons, against a peak of 35,000 tons in 1929.

Saltcake and Glauber Salt production was estimated at 230,000 tons in 1932, compared with Sulphate Union sales of 300,000 tons in 1929. Exports of sodium sulfate reached a peak of 188,000 tons in 1930, of which 77,000 tons were shipped to U. S. In 1932 total German exports were 160,400 tons, with 34,600 tons to U. S. Hydrochloric production probably declined to 150,000 tons in 1932 from a peak of 250,000 tons.

German potash industry produces magnesium compounds and bromide as by-products. Production of magnesium sulfate declined to 66,000 tons from 155,000 tons in 1929, and 96,000 tons in 1931; magnesium chloride to 34,500 tons solid (48%) and 26,000 tons liquid (35%) from 49,000 tons solid and 74,000 tons liquid in 1920; bromine to 850 tons from a peak figure of 2,650 tons in 1930.

Japan

Sumitomo Fertilizer (Japan) is completing new ammonium chloride plant. Between 700 and 800 tons is anticipated in 1st six months. Present consumption is estimated at 3,000 tons. Imports from Great Britain during 1931 amounted to

(over)

25,405 piculs, out of a total of 37,102 piculs. Total imports in 1932 amounted to 30,143 piculs, and during the 1st 3 months of 1933. 6,612 piculs.

Tokio Aniline Dye is stepping up monthly methyl violet output to 10,000 kin. Tokunaga Chemical is ready to make naphthol A. S. series of intermediates. Imperial Dyestuff is making Cibanol Black and Cibanol Olive. Jap synthetic indigo production in 1st 6 months of '33 amounted to 240,000 kilos., as compared with 164,600 in all of '32.

Japan is aroused by resumption of heavy alkali imports of Russian material.

Italy

Italy plans to regulate nitrogen fertilizers through formation of a committee under the Ministry of Corporations. Purposes are: check needs and supplies, to regulate imports by import licenses; buy and sell, to warehouse, and, generally, to do anything necessary to assure supplies for Italian agriculture and industry.

Chilean Nitrate Plan

Main lines of the plan to reform nitrate industry, as it has been approved by the Chilean Chamber, are now reported. Monopoly of the sale of nitrates belongs to the State, which may cede it, or hire it out for a maximum of 35 years to a selling organization. (This monopoly may have political consequences, since the State assumes legal and moral responsibility for sale of nitrate). For annual sales of up to 1,000,000 metric tons, 10% of total will be taken from already existing stocks, and 90% will come from fresh production. If sales exceed 1,000,000 metric tons, 25% will come from stock, and 75% from fresh production. Profits from the sale of already existing stocks are to be paid to the original creditors of the nitrate industry before the formation of Cosach, who are known under the name of "the beneficiaries of the Ramirez plan. Participation of the State in the profits will be on a sliding scale between 25% and 45%, according as sales range between 800,000 and 1,500,000 metric tons annually.

Foreign Phosphate

Societe Commerciale des Phosphates d'Algerie et de Tunisia, Tunis, has been formed to co-ordinate phosphate rock sales of French North Africa. Although supposedly a sales organization for Algerian and Tunisian rock the fact that its chairman is M. de Baillencourt, sales director of the Moroccan office of Cherifien des Phosphates, indicates close relationship with Moroccan producers. New company will control export quotas and put into effect agreement with U. S. rock producers, it is reported.

Spanish Potash

Sociedade Potasas Ibericas, (Spanish potash producer) which last year increased its capital from 3.25 to 13.25 million pesetas, has now decided to make a further increase to 20 million pesetas. New capital is to finance steadily progressing output.*

French Alsacian potash industry has been reorganized, the result of recent legislation. The Mines Domaniales de Potasse d'Alsace, which are State-owned, have been granted a government monopoly to all new potash deposits which may be discovered in France or in French Possessions. State mines have also, under provisions of the legislation, concluded an agreement with the private mines for the establishment of a common sales organization, which is also to have an import monopoly for all fertilizer potash imported into France. At least 71% of French potash sales are to be from the State mines, and the balance from private mines. Minimum selling prices for fertilizer potash are to be fixed officially. Following product is to be exempted from the provisions of the import monopoly: Potassium carbonate of 70-80% purity and over of vegetable or animal origin when not mixed with other potash and when imported for use in soap, glass, or woolen industries. — For 1st half of the current year French State mines produced 30,621 tons of crude potash salts containing 12 to 16% of potassium oxide (35,348 tons in the 1st half of 1932), and 84,771 tons of potash fertilizer salts of various kinds, both figures being calculated in terms of pure potash.

Societe Anonyme du Djebel-Hallouf has received concession to work bromine and potash plant at the Zarsis Saline, Tunisia, formerly operated by a German syndicate and at which 1,055 tons of bromine were produced between July '17 and Dec. '18.

Foreign Notes

Chilean and Belgian nitrate interests are in agreement and latter's material will be maintained at 12.50 francs per 100 kilos more than the official price for Belgian sulfate.

Municipal Gas Wks., Helderscheweg 27, Alkmaar (Holland) is to build an ammonia factory.

The export of gum copal from Sierra Leone is to be prohibited for a period of 1 year from Jan. 1 next.

New Construction

Chemical construction announcements continue to indicate improvement in this direction.† Outstanding in the month's news were: American Commercial Alcohol is spending approximately $500,000 to double capacity of its distilling plant at Pekin, Ill., which now has a capacity of 7,500 bus. of grain daily, or 35,000 proof gals. of whiskey. Additional capacity is expected to give plant an output of approximately 70,000 gals. daily, or about 25,000,000 gals. annually.

Harshaw Chemical will build an addition to its plant which will be used as its pigment department. The cost of the new structure will be about $45,000.

Other projected building operations include a new addition plant at Dunkirk, Can., by Natural Sodium Products to be used for dehydrating natural sodium sulfate; U. S. Lacquer plans to rebuild its plant on Coit st., Irvington, N. J.; Kayer Manufacturing is planning a soap producing unit at Elizabeth, N. J.; Andrew Juergens Co., Cincinnati, is also planning a soap plant; Phelan-Faust Paint, St. Louis, is to lease a new plant being built for them; Richards Chemical, Jersey City, is planning a $60,000 addition; Commercial Solvents has awarded contracts amounting to $200,000 for plant additions at Terre Haute.

Allegany Refineries, Bolivar, N. Y. expects to have 1st unit of new plant in operation shortly. Company will produce gasoline, kerosene, naphtha, wax, distillate, etc. Preliminary work on the proposed $4,000,000 fertilizer plant at Muscle Shoals (Nitrate Plant 2) is now limited to clearing. Actual construction work is anticipated to begin about Jan. 1. Charles H. Young, TVA chemical engineer, is in charge of preliminary operations. Merck has let contract for 2 1-story warehouses at Rahway, each with approximately 14,000 sq. ft. Allied Mills is completing $500,000 soybean plant at Norfolk.

November Corn Operations

November operations of corn refiners have been at the heaviest rate in the history of the industry, according to the Corn Industries Research Foundation, the grind for the month approximating 9,000,000 bu., a step-up of more than 50% above normal for this period. This unusual activity reflects a general move on the part of users of starches, syrups, sugars, dextrines and other corn derivatives to anticipate the processing tax on products of corn which will shortly become effective.

Refining operations in December will be on reduced schedules largely for restocking purposes. Refiners are accordingly buying very little cash corn at the terminal markets, although under normal conditions corn refining absorbs about a third or more of the shipments received.

British Air Ministry has issued specifications (D. T. D. 116A) for ethyleneglycol. Copies 6d. net, H. M. Stationery Office, London.

"Triplex Toughneed" is a new safety glass marketed by Triplex Safety Glass, England.

*See page 531 of this issue for a description of mining operations.

†See page 544 for announcement of Mathieson's proposed Lake Charles alkali plant.

Traffic

Special M. C. A. committee will study proposed regulations governing truck intrastate and interstate explosive shipments before they are submitted to I. C. C. and various state bodies by the Bureau of Explosives.

Rate Changes

N. Y. P. S. C. has approved lower commodity freight rates of the Erie, Lehigh Valley, N. Y. C. (East) and West Shore on calcium carbide, in drums, carloads, minimum weight 50,000 lbs., from Buffalo to Niagara Falls 9c per 100 lbs., reduction 4c per 100 lbs. weight, effective Nov. 5.

Commission has approved lower commodity freight rates of the N. Y. C. on blackstrap molasses, including final molasses and refiners residual syrup, in tankcars, estimated weight 11.7 lbs. per gal., carloads, minimum weight 90% of gallonage capacity of shell of tank, unless said minimum exceeds carrying capacity of the car in which event minimum will be 90% of carrying capacity of the car, from New York, Brooklyn and vicinity to Utica on N. Y. C., and to Utica, South Utica and New York Mills on the West Shore, 18c per 100 lbs., reduction from class rates, effective Dec. 1.

Commission has also approved commodity freight rates of the N. Y. C. (East) and West Shore on caustic liquor, in tankcars, carloads, minimum weight tank capacity of car, but not less than 90,000 lbs. from Echota and Niagara Falls to Black Rock, Buffalo, East Buffalo, Harriet and North Tonawanda, 4c per 100 lbs., reduction effective Dec. 6.

Commission has approved new commodity freight rates of the Lehigh Valley on silico manganese, carlots minimum weight 56,000 lbs. from Niagara Falls and Suspension Bridge to Cortland, $2.90 per gross ton. Reduction from class rates effective Dec. 15.

Commission has approved a reduced commodity freight rate of the Lehigh Valley on common salt, carloads, minimum weight 45,000 lbs., from Ludlowville to Watkins Glen, on the Pennsylvania, on shipments when destined for storage, distribution, or subsequent forwarding on or via Pennsylvania, 6.5c per 100 lbs., being a reduction of 3c per 100 lbs., effective Dec. 7.

Commission has approved lower commodity freight rates of the Erie on sulfate of ammonia, carloads, minimum weights 40,000 lbs., from Black Rock, Buffalo and East Buffalo to North Collins, 8c per 100 lbs., being a reduction from class rates, effective Nov. 1. It has also approved rates of the N. Y. C. (East) on the same commodity, carloads, from stations East Buffalo Suspension Bridge, inclusive, to Malone, 25c per 100 lbs., reduction from class rates, effective Nov. 5.

Buying Advice

Brookmire Commodity Bulletin Nov. 20 urged purchase of linseed oil in sufficient quantities to cover 1st half year requirements and cottonseed oil somewhat in excess of present needs. Referring to naval stores, report states "We expect an increase in demand for both rosin and turpentine next year, and we advise maintaining stocks well in excess of current needs."

October Employment

Unemployment rose in October to 10,076,000 an increase of about 11,000 over the previous month but 1,510,000 under October, '32, according to an A. F. of L. report issued Nov. 26. Buying power, however, rose 2.2% and was 23.1% above March (in dollars, about $600,000,000). Unemployment usually has a seasonal advance in October and the fact that the advance was very small is taken as an encouraging sign.

Employment in chemical industries was more than 33.3% above general manufacturing average in October. It had gained more than 20 times as much over the preceding month, and a 3rd more in comparison with October, 1932. Payroll totals in the chemical group stood more than 45% above the general average in October. They had gained 8 times as much over the preceding month, but about one-fifth less than the average in comparison with October, 1932.

Employment

	Oct., 1933	*Sept., 1933*	*Oct., 1932*
Chemicals	120.9	118.6	84.7
Cottonseed, oil, cake, and meal	62.9	54.4	54.1
Druggists' preparations	80.8	76.9	71.7
Explosives	105.9	103.8	75.7
Fertilizers	72.1	65.2	45.1
Paints and varnishes	80.4	80.4	68.2
Petroleum refining	72.7	70.0	61.8
Rayon and related products	197.3	196.7	139.6
Soap	116.7	116.0	96.9

Payroll Totals

	Oct., 1933	*Sept., 1933*	*Oct., 1932*
Chemicals	87.0	81.8	61.7
Cottonseed, oil, cake, and meal	60.3	49.8	44.9
Druggists' preparations	80.3	75.4	70.4
Explosives	77.4	71.7	51.2
Fertilizers	48.0	42.5	30.1
Paints and varnishes	61.0	59.2	54.6
Petroleum refining	59.8	57.6	52.2
Rayon and related products	172.4	168.3	118.3
Soap	92.6	91.9	84.4

Employment in factories in N. Y. State, manufacturing chemicals and related products, increased 1% between the middle of September and the middle of October. Employment in these lines in N. Y. City increased 2.6%.

Safety with Celluloid

International Labor Office (League of Nations) has just published "Safety In The Manufacture and Use of Celluloid"—a most valuable contribution to the safety literature in view of the several serious catastrophies of the past few months in this field. Everyone engaged in the celluloid industry should read this publication. Copies are available at $1 from World Peace Foundation, 40 Mt. Vernon st., Boston, Mass.

Quotations

Dr. Henry G. Knight, U. S. Dept. of Agriculture, before A. C. S. Midland Section—"Without insecticides it would be impossible to feed the world as society is organized today."

John J. Watson, N. F. A. president before Atlanta convention—"The improved prices of farm products have already had some beneficial effect on our business."

Dr. Lewis H. Marks, former Alcohol Institute secretary and now president, Continental Distillery,—"Wood only makes whiskey impure and increases the tannic acid in it. We have eliminated the acid and the fusel oils that are responsible for the hangover."

Dr. Arthur D. Little, Arthur D. Little Inc., November *Industrial Bulletin*—"The solvents industry came into existence so quietly that even those engaged in it seldom stop to realize how large and important it has become."

Pierre S. du Pont, chairman E. I. du Pont de Nemours & Co., speaking before the Federal Bar Association—"If you can show me a dry State, I can answer your question (protecting a dry state against a wet state). There ain't no such animal. A certain number of people in any State will want to drink and they are going to get liquor."

Rudolph Zinsser, before the Trade Sales Conference of the recent paint convention: "Without fair and reasonable profits, manufacturers cannot continue to pay New Deal wages, or pay much needed taxes to the Government, or even remain in business. Everything, in the end, gets back to the pay envelope. And the pay envelope depends on what the "boss" is able to get back in profits."

Sir Harry McGowan, chairman of I.C.I., speaking before the Economic Federation of Japan:

"Modern industry operates under 2 unavoidable conditions—concentration into larger units and an uprising of economic nationalism, due to a natural desire of the nations to be masters of their own destiny economically as well as politically. Economic nationalism means over-production, wasteful competition, and far-reaching disequilibrium. The study of agreements for the control of production by heads of industries who can meet corresponding leaders abroad and make decisions is, in my view, the compelling reason for more personal contacts. It is vitally important that we should cultivate a 1st hand acquaintance with foreign markets and also with foreign producers."

Chemical Fads and Fancies

Word "Syntex" has been suggested as a new name for rayon.——Dr. Arthur D. Little reports that competition to private laboratories from the Bureau of Standards has been reduced 75% with further decrease in sight.——Dr. Gustavus J. Esselen, guest speaker on Nov. 13 of the New England Council, told a radio audience how chemistry has turned red ink into black and restored profits in many New England industries.——D. T. Macaughtan, research director for the International Tin Research and Development Council, has arrived in this country for a tour. He will speak before the American Tin Trade Association dinner in December.——C. C. Concannon, chief, Chemical Division, Bureau of Foreign & Domestic Commerce, discussed NRA recently before the Berlin American Chamber of Commerce.——Albert B. Baker, Bradley & Baker, is touring Europe and will be back just before the holidays.——Arthur D. Little's *Industrial Bulletin* reports that so many processes for rapid ageing of whiskey are on the market that a large distilling company has set aside an entire floor of its office building for interviewing applicants who expect the use of their methods will revolutionize the industry.——The discussion raging over inflation has served to resurrect the old old story of the gold in sea water. It has been given a slight new twist, however. Some economist (not in Washington) declares there is sufficient to give every 1 of the 2 billion men, women and children $21,000 each. If that isn't Utopia! What's the matter with our stupid chemists?——Williams Haynes, publisher of CHEMICAL INDUSTRIES and PLASTIC PRODUCTS, spoke before the Hercules Mens' Club at luncheon on Nov. 20 on "Fear, Greed and Chemicals."——Mathieson sold at a new high (46) for '33 on Nov. 20. Street evidently "took kindly" to the new alkali schedule.——Dr. E. H. Killheffer was elected a director of the Home Market Club at its 46th annual meeting on Nov. 15.——Bureau of Standards reports success in using soda salts instead of potash in manufacture of optical glass.——Polish correspondent for the A. C. S.' *I. & E. C.* reports carbon dioxide shooting up from an oil well suddenly transformed a torrid bathing beach to a winter scene. Oh well—we're not going to Miami this year.——Our congratulations to *Chemical Engineering and Mining Reviews* (Australia) on its 25th birthday. Also to *Industrial & Engineering Chemistry* and Dr. Howe, its editor. With the December issue it has passed its 25th milestone.——Beck, Koller's president, Henry Reichold, and L. W. Parsons, Tide Water Oil's chief chemical engineer, were passengers on the Graf on its recent crossing.——Lammot du Pont married Miss Margaret A. Flett of Racine, Wis. on Nov. 24. His son, Reynolds du Pont was best man.——Salt is said to make a splendid bonding agent in road-making where gravel, clay and 15% salt are mixed.——Arthur B. Purvis, president, Canadian Industries, Ltd., writes on Alfred Nobel in the November issue of *Canadian Mining Journal*. In the same issue is a fine article on "Gold—Its Relationship to Mankind." In view of the activity of dairy economists, etc., to give us a "baloney dollar" the review is specially timely.——Lord Leverhulme has been elected president of the London Chemical Club. J. Davidson Pratt, well-known in this country, is secretary.——Dr. Friedrich Bergius spoke on the utilization of wood for the production of foodstuffs, alcohol and glucose, before the Institute of Chemical Engineers (England) on Nov. 15.——Pierre S. du Pont has been appointed to the National Labor Board to fill vacancy caused by the recent death of Edward N. Hurley.*——Oscar Nelson, United Carbon president, was host to more than 100 guests at a week-end party Nov. 11, at Charleston, W. Va.——Elon H. Hooker is chairman of the Engineers' Group of the N. Y. City United Hospital Fund.——Thomas F. Hanrahan, manager of Carbide's foreign shipping dept., returned recently from a Caribbean cruise.——We wonder how Joseph Turner was finally persuaded to move out of 19 Cedar st. For years he has been the only non-insurance company tenant in the building which is in heart of the N. Y. City insurance district.——Sir Harry McGowan will tour the U. S. on his way back to England from the Orient.——Dr. Charles H. Herty has been appointed a deputy administrator of the NRA and has been assigned to division 3 in charge of codes for the chemical industries.

Washington

Processing tax on corn, fixed at 5c per bushel on Nov. 5, will be continued indefinitely under an order promulgated by the Secretary of Agriculture, approved Nov. 30.

Under A. A. A.'s original order a processing tax of 20c per bushel would have become effective Dec. 1. This action will not, however, affect scheduled increases in the hog processing taxes.

*On Dec. 5, Mr. du Pont was elected chairman.

NRA has appointed Mark Ladorilla labor advisor for the candle manufacturing and beeswax bleaching and refiner's industries; John O'donnell for the insecticide and disinfectant industry; A. Howard Myers for the dry mop and polish industry; and John J. Manning for cement. Other appointments include Gen. T. S. Hammond of the Whiting Corp., Harvey, Ill., chief of the Trade Association Division of NRA, as industrial advisor for the conveyor and material preparation equipment manufacturers industry; and B. A. Brennan of Baltimore, member of the Board's resident advisory staff, as industrial advisor for the stearic acid and oleic acid manufacturing industry.

Carbon black code hearing Nov. 16 was a very harmonious affair, with Labor Advisory Board limiting principal request to a 42 hour week averaged over 6 weeks. Code provides hourly rates of 55c minimum for Texas, 50c for Oklahoma, and 40c for Louisiana. Columbian Carbon's Reid L. Carr, explained that limitation of production to actual sales provided in code was due to the fact that practically every manufacturer in the industry has a year's supply on hand.

Fire extinguishing appliance manufacturing industry code was approved Nov. 8.

Wood Chemical Institute filed a request Nov. 18 with the Bureau of Industrial Alcohol for return of methanol as a denaturant for completely denatured alcohol on repeal of prohibition Dec. 6.

Increased taxes on technical undenatured ethyl alcohol will be introduced in Congress as part of the new liquor tax schedule now being made up.

Acme Shellac Products, Long Island City, N. Y., has been directed by the Federal Trade Commission to discontinue advertising and selling its products as "Shea-Lac" when not made from shellac gum dissolved in alcohol or when shellac gum is not the predominant element.

Exception to this order is permitted if the word "Shea-Lac" or any other word which in appearance or sound simulates the word shellac, is accompanied by the word "substitute," or by "other apt and adequate words, in equally permanent and conspicuous lettering, clearly indicating that such product is a substitute for genuine shellac." Commission found the Acme company made and sold both shellac and shellac substitutes.

M. E. Baker (Boston electroplating and finishing supply house) has acquired Boston Plating Supply. Arthur W. Collins of the latter will remain. Charles H. Proctor spoke at a recent meeting of the newly formed United Electroplaters' League.

Heavy Chemicals

Further South

For several months rumors have been present in the industry that Mathieson was contemplating an alkali plant in the South. These were finally confirmed when the company filed a registration statement with the Federal Trade Commission covering an offering of 207,761 shares of no-par common stock at $30 a share.

Mathieson's Allen startles alkali world with announcement of a $7,000,000 plant at Lake Charles, La.

Warrants, including rights to subscribe for additional common stock, also are to be issued.

Stock will be offered to common stockholders of record at 3 p. m. on a date not later than Jan. 4, '34, to be fixed by the president of the company. They will be offered privilege of subscribing for 1 additional share of common for each 3 shares of such stock then held. Subscription price of $30 a share will be payable in 3 instalments, $10 upon subscription, $10 about 4 months after expiration date of the offer, and $10 approximately 8 months after such expiration date.

Offering of common is not being made to preferred stockholders. Registration statement said that in the opinion of counsel there are no rights in the preferred stock with respect to common. Preferred is expressly preferred and limited as to dividends and participation in assets, it was stated. Additional preferred stock cannot be issued without consent of at least 60% of preferred stockholders. "If by reason of this offer to common stockholders, any claim should be made by any holder of preferred stock for right to subscribe to preferred stock, company will be willing to ask stockholders to increase authorized amount of preferred stock so that it can satisfy such claims by offering additional shares of preferred stock at the market price, but not less than par," the statement said.

Statement listed Carrie M. and Robert G. Stone, trustees, as among the principal holders of common, 60,000 shares. Robert G. Stone, also of Boston, is listed as holding 2,000 shares of common and Carrie M. Stone is also listed as holding 540 shares of preferred. E. M. Allen, is listed as owning 13,200 shares of common. Other holders include Frank A. Sayles (deceased), Providence, R. I., 6,160 shares of common and 800 shares of preferred; trustees under the will of Frank A. Sayles, 2,200 shares of common and 527 shares of preferred; Sifleet & Co., Jersey City, N. J., 7,900 shares of common; Johnston Pile & Co., Jersey City, 6,800 shares of common; Sigler & Co., N. Y. City, 6,802 shares of common and 500 shares of preferred; Eddy & Co., N. Y. City, 4,966 shares of common; James R. MacColl, Providence, R. I., 4,424 shares of common; Hayden, Stone & Co., 50,159 shares of common and 296 shares of preferred; Mathieson Alkali, 36,778 shares of common and 7,869 shares of preferred. Mathieson holdings of common include 9,625 shares subscribed for by employes.

Important Price Changes

	Nov. 30	Oct. 31
ADVANCED		
Acid chromic	$0.13½	$0.12¼
Aluminum sulf., com.	1.35	1.25
Bleaching powder	1.90	1.75
Corn syrup, 42°	2.84	2.73
43°	2.89	2.78
Glauber salts, cry	1.10	1.00
Glycerine, dynamite	.10¼	.09½
Soap, lye	.06½	.05¾
Potassium bichromate	.08⅛	.07¾
Sodium bichromate	.06⅛	.05¾
Sodium sulfate, anhyd	2.20	2.00
Sodium silicate, 40		
tanks	.65	.60
drums	.80	.75
Tin crystals	.39	.36½
oxide	.53	.50
tetrachloride	.27	.24
REDUCED		
Sodium stannate	.31½	.32

A Five Year Study

Mathieson's new plant will be located at Lake Charles, La., It will cost, it is reported, over $7,000,000. Stone & Webster will erect the structure.

Selection of the site culminated a 5-year study. Extensive salt rights have been acquired at Hackberry (La.) oil field and brine will be carried through a 20-mile pipe line. The pipe line will cost $20,000 per mile to lay.

Plant will produce soda, soda ash, caustic soda and other chemicals supplementing plants at Saltville, Va., and Niagara Falls. A contract has been let for dredging a 3-mile canal from the salt holdings to the Lake Charles ship channel above Hackberry.

Contract Prices Higher

Following the announcement of ash, caustic and chlorine schedules early in November (reported in the November issue) producers of most of the leading items released '34 prices. Increases are numerous, a number of items remain unchanged from '33 levels, it is difficult to find 1 where a reduction has been made. Where prices have been advanced the increases have been very moderate.

Bichromate producers announced 6⅛c as a base price for soda. While this is a sizable advance over the present year's figure, it is merely restoring the '28 market status. In the contract season of that year producers raised the price to 7c with certain discounts for various sized contracts which brought the average price down to 6¾c. Ash and ore prices have been advanced and producers have been selling below manufacturing cost.

Sodium silicate prices were advanced as a direct result of higher ash. The net change is 5c per 100 lb. Higher alkali prices are also largely responsible for advances for '34 in Glaubers Salt and anhydrous sodium sulfate, the former 10c and the latter 20c per 100 lbs. Bleaching powder is now quoted at $1.90 for contracts. Aluminum sulfate, commercial grade, was advanced 10c and is quoted at $1.35 for carloads under contract.

November tonnages were about equal to October. Alkali shipments to the rayon and glass industries featured that market. Where important price advances have been made consumers have been taking

September Statistics on Calcium Acetate and Methanol†

Methanol

	1931 Sept. (Gallons)	1932 Sept.	1933 Aug.	1933 Sept.	Totals, 9 mos. (Jan.-Sept.) 1931	1932	1933
Refined—							
Wood distillation—							
Production	56,519	102,448	181,625	106,494	1,413,110	1,014,518	124,842
Shipments	98,431	92,220	97,697	91,462	1,444,031	906,205	1,883,806
Stocks, end of month	227,193	257,763	444,179	459,211	....	....	....
Synthetic—							
Production	663,216	697,890	860,314	1,460,589	5,805,226	5,887,377	5,088,678
Shipments	699,380	550,862	955,301	1,425,009	3,973,860	3,935,871	7,085,247
Stocks, end of month	2,927,406	3,829,635	1,178,525	1,214,105	....	....	....
Crude—							
Production	133,507	98,108	262,446	243,183	2,673,267	1,699,296	2,096,199
Shipments	*.......	246,139	252,711	255,166	*.......	*.......	2,057,523
Stocks, end of month	472,561	329,507	295,354	313,371	....	....	....

Calcium Acetate

	Pounds						
Production	782,131	1,563,312	3,592,655	3,772,243	33,704,950	22,522,000	29,756,293
Shipments	6,323,289	3,113,431	†5,168,393	3,031,092	43,783,254	27,951,936	31,112,650
Stocks, end of month	12,551,680	4,398,913	4,178,693	4,929,844	....	....	....

*Date not available. †33 establishments.

sizable shipments in an effort to wind up the year with a substantial inventory. Spot sales in the past month were off. Total volume of business, was, however, above the same period of '32. Actual signing of contracts was reported to be progressing at a very satisfactory rate. Consumers are in a different frame of mind now than they were at the close of '32. Business has been better, a better feeling abounds, prices are rising and this alone is sufficient to change the situation fundamentally.

Copper Sulfate Statistics

Statistics published recently in *Die Chemische Industrie* show a small increase in both production and use of copper sulfate in 1932 compared with 1931. Production in 1932 amounted to 285,501 tons, Italy contributing 99,567, France 44,000 tons, Great Britain 48,285, Germany 30,000, Belgium 24,449, and the U. S. 22,700. Production in Italy and in this country showed a marked increase compared with 1931, when the figures were 77,271 and 33,860, respectively. French production showed a decline (52,-200, 1931). By far largest users in 1932 were Italy (105,700) and France (82,000).

Caledonian Chrome Ore

New Caledonian chrome ore production rose from 52,600 tons in '29 to 61,900 tons in '30 but declined to 15,000 tons in '32. Five mining companies are on the island (mid-way between Australia and New Zealand and formerly a French penal colony). Most important were Societe Tiebagehi and Societe Chimique du Chrome. Latter is the mining unit of Mutual Chemical (bichromates, chromic acid, etc.). Enoch Perkins, Chimique du Chrome mines manager, returned to the U. S. this year. Chrome & Nickel Co. of Indo China working a newly discovered deposit is producing between 1,000 and 2,000 tons annually. Turkish chrome ore '32 exports totaled 53,716 tons compared with 29,000 tons in '31. Total for '33 is expected to double that of last year.

Heavy Chemical Co. News

United Carbon president, Oscar Nelson, in quarterly report, stated that 9 months carbon black sales exceeded '32 total. He predicted success for newly formed Export Association. Tioga Wood Products, Morris, Pa., idle for years, has been purchased by R. W. Hilton (president, Penn Charcoal & Chemical, Smethport, Pa.). Amersil Co., (silica and quartz products) has purchased a building at Hillside, N. J

Argentine Imports

Argentine alkali imports increased during 1st half of 1933, compared with corresponding period of 1932. Caustic receipts increased 14% to 6,115 metric tons and sodium carbonates rose 17% to 7,978 tons.

Sulfur imports declined during period under review from 10,142 tons to 5,585 tons.

Miscellaneous Notes

Carbon black imports into Argentina in first quarter were 226 metric tons, compared with 237 tons in corresponding period in 1932 . . . Bleaching powder production in Japan totaled 25,264 metric tons in 1st 5 months of this year. Production of caustic (one producer excluded) was 21,264 tons . . . Magnesium sulfate was found to have unusual value in flotation work during experimental research activities recently undertaken in Australia. It was noted that magnesium sulfate acted as an activator for marmatite.

Fine Chemicals

Exchange and Prices

Violent fluctuation of the dollar in the world's money markets was responsible for a number of price changes. It must be distinctly appreciated that prices, especially of items imported, are largely nominal when the dollar jumps about at the pace set early in November. The Pound actually reached a figure of \$5.52¼ on Nov. 16.

Bismuth metal was advanced from \$1.20 to \$1.30 per lb., but as yet the bismuth salts have not been revised. Mercury was higher due to the exchange. Iodine, both crude and resublimed, and several iodine salts were quoted higher, largely for the same reason. Silver nitrate fluctuated widely in the past month, but closed the 30 day period with a net gain, the result of the strong position of the metal. The long-anticipated advance in c.p. glycerine was finally made. It is possible that further strength may raise quotations still higher. Practically all of the more important potash salts, including potassium oxalate, were advanced in the 3rd week of the month. November business was about equal to the previous month and ahead of the corresponding month a year ago. Seasonal items were in good demand.

Important Price Changes

ADVANCED

	Nov. 30	Oct. 31
Acetphenetiden	\$1.30	\$ 1.20
Bismuth, metal	1.30	1.20
Glycerine, C. P.	.11½	.10¼
Hydrogen peroxide, gross		
¼ lb. bottles	7.25	7.00
½ " "	10.50	10.00
1 " "	16.50	15.50
Iodine U.S.P., resub.		
cry., 25 lb.	2.40	2.10
5 lb.	2.50	2.20
Mercury, metal	68.00	66.00
Mercuric Chloride*		
100-150 lb. kegs	.82	.77
25 lb.	.83	.78
5 lb.	.90	.85
Potassium Iodine U.S.P.		
275 lb.	2.15	2.00
100 lb.	2.15	2.00
25 lb.	2.15	2.00
5 lb.	2.25	2.40
Silver nitrate	.31⅛	.29⅞

*Crystals 15c per lb. higher than gran. or powd.

Italian Citric Industry

Chemiker Zeitung, (Germany) reports competition of fermentation citric acid has hit the Sicilian industry so hard that during 1932-3 only 32 of the 292 of lime citrate plants were in operation. In order to remedy unemployment position proposal has been made by the syndicates that the Italian Government should grant a premium of 2 lire per quintal of lime citrate made. On the recommendations of the Confederazione Agricoltori, however, it was later agreed that it would be advantageous if the premium were to be granted on the finished citric acid. Reason is that considerable hopes are entertained as to the alleviation in the position of the Sicilian citric-acid industry which should follow the successful adoption of the Leone patent for the direct production of the acid from the citrous juices. At present this process is being elaborated at the Asenella works, which belong to Montecatini. If the premium on the finished acid were granted, there would seem little grounds for the continuance of the lime citrate monopoly held by the Camera Agrumaria. It is understood, though, that the syndicates later reverted to their original contention that the premium would be more valuable on lime citrate, so far as the employment position during coming winter was concerned.

Mercury In '32

Frankfort estimates world production of mercury last year showed a 23% decline on 1931. As compared with 1929, the year of highest output, last year's production showed a decline of more than 50%. Actual production figures, in tons, were: 1929, 5,588; 1930, 3,775; 1931, 3,496; 1932, 2,704. In regard to individual producing countries, recent figures are as follows: Spain, 815 tons in 1932 (682 tons in 1931); Italy, 956 tons (1,298 tons); Czecho-Slovakia, 45 tons (76 tons); Russia, 110 tons (110 tons); U. S., 435 tons (860 tons); Mexico, 253 tons (251 tons); and Boliva, 30 tons (35 tons).

Mercury Code?

Western quicksilver producers are hoping that early adoption of a code and some protection against foreign material will revive the industry which has had 2 very lean years. First code did not afford protection against low-cost imported material. New code is being drafted.

New Locations

Abbott Laboratories has purchased a St. Louis building and will serve 10 states from that point. Paul M. Wagner, Dallas, distributor for Givaudan-Delawanna, John Powell & Co., and Interstate Color has moved to 715 Praetorian Bldg. McKesson & Robbins has moved to 155 E. 44 st., N. Y. City. Cliff st. building will be used chiefly as a warehouse.

Cadmium In '32

U. S. 1932 cadmium production amounted to 799,501 lbs., against 1,050,529 lbs. in 1931 and 2,777,762 lbs. in 1930, record high output. In January, 1931, price of cadmium in New York dropped from 70 to 55c a lb., where it remained throughout 1932.

In addition to metallic cadmium domestic manufacturers reported production of cadmium compounds—mainly cadmium sulfide, cadmium oxide, and cadmium lithopone—cadmium content of which was 259,800 lbs. in 1932, compared with 337,200 lbs. of cadmium in compounds in 1931.

There were no imports of cadmium metal in 1932; in 1931 only 271 lbs. were imported but in 1928 and again in 1929, more than 200,000 lbs. of foreign cadmium were entered for the domestic market. Detailed description of uses of cadmium and statistics on world production are contained in the chapter of cadmium which forms a part of "Minerals Yearbook, 1932-33" which has just been issued by Bureau of Mines, and which may be purchased from Superintendent of Documents, Washington, D. C., at $1.25.

J. T. Baker Chemical Appoints

Philip J. LoBue is N. Y. sales manager for J. T. Baker Chemical. He has been with Baker for 4 years and previously was with P-W-R in Philadelphia.

Reorganization

United Molasses, Ltd., plans reorganization by writing down "ordinary" capital and dealing with arrears in preference share dividends, says a letter of the directors to stockholders accompanying the annual report.

Early in the Summer company sold all its shareholdings in Dunbar Molasses, and associated companies, including Rossville Commercial Alcohol. In addition £125,000 marketable securities were sold. Sales and a reduction in inventories enable company to settle a bank loan of £629,000 and an indebtedness of £97,000 on account of a motor vessel.

W. F. Henderson, Visking Corp., spoke on "Cellulose Xanthate Reactions" before the Chicago A. C. S. Section on Nov. 25.

Paints, Lacquers and Varnish

Carbon Black Prices

Paint materials markets were spurred into action when carbon black producers finally announced the long-awaited '34 contract prices. As was generally expected the advance amounted to about 1¼c. Quotations have been completely revised and are now on a delivered basis rather than on an f.o.b. producing plant basis.

On carload shipments, delivered, new price on the Atlantic Coast, as far south as South Carolina, is 5.35c; in the midwest, in virtually the Central Freight Association territory, 5.05c, and on the Pacific Coast, 4.90c for 50,000-lb. lots and 5.05c for 30,000-lb. lots. The price is 1 that nets about 4c at producing points. Former price was 2.72c a pound f.o.b. Texas works, which was the lowest price in the history of the industry. New schedule establishes prices about equivalent to those in effect early in 1931. Export prices, quoted c.i.f. European distinations, have also been marked up slightly, following the recent advance of 1¼c.

Barytes Unchanged

Barytes contracts are being renewed at this year's prices. Dry-color producers have not as yet announced '34 contract figures. It is expected that the chromes will be higher based on higher bichromates prices. Lead was off $5 a ton as the month closed. No change has yet been made on the pigments and it is thought that producers will wait on the trend of the market before announcing any revision. Corroders of white lead and other lead pigments did, however, earlier in the month revise their discount scale on prices for material in kegs to the dealer trade. Lithopone and titanium pigment manufacturers are writing up contracts for 6 months but the zinc oxide producers are limiting contracts to 3 months. There is little change in the schedule for American process oxides. The 35% leaded grade will be raised 10 points to the basis of 5c per lb. for car lots, minimum 20 tons. The former 2-ton quantity price has been discontinued and car lots of 20 tons minimum must be ordered to obtain the quantity prices. French process oxides were offered on 3 months' contracts at a reduction of ¼c per lb. Schedule is:—White seal, 20-ton lots, 10⅝c per lb.; less than 20 tons, 10⅞c per lb. Green seal, 20-ton lots, 9⅜c per lb. for bags, 9⅝c per lb. for bbls.; less than 20 tons, 9⅝c per lb. for bags and 9⅞c per lb. for bbls. Red seal, 20-ton lots, 8⅜c per lb. for bags, 8⅝c per lb. for bbls.; less than 20 tons, 8⅝c per lb. for bags and 8⅞c per lb. for bbls. French process lead-free oxide continues without price change, with 20-ton lots at 5¾c in bags, 6c in bbls.; less than 20 tons 6c in bags and 6¼c in bbls.

Lithopone makers have set car lots as the quantity pricing basis at 4½c per lb. for bags and 4¾c for bbls., with less than car lots priced at 4⅞c per lb. for bags and 5c per lb. for bbls. Exception is in metropolitan N. Y. City and Chicago, where orders for 5-ton lots in single deliveries are acceptable at car-lot prices.

Titanium dioxide producers have established 5-ton and 1-ton prices for single deliveries but otherwise the schedule for 1st half will be unchanged. Barium and calcium titanium pigments will also be unchanged but sellers report that the prices named on Nov. 17 are those expected to remain effective to the end of June.

Paint Association News

The N. Y. Paint, Oil and Varnish Club has been reorganized as the N. Y. Paint, Varnish & Lacquer Association to be more in keeping with the "New Deal." National Association of Paint Distributors has also changed its name—now the National Wholesale Paint Association. Headquarters have been changed to Washington with Howard R. Drake, secretary, installed in the offices of the national paint body. Over 60 attended the N. Y. Paint & Varnish Production Club's November meeting presided over by Fred Hopkins, Murphy Varnish. New England Paint Club is celebrating its golden jubilee.

New Members

New Chicago Paint Club members include T. F. Peterson, Tamms Silica; H. J. Jensen and Fred. A. Stresen-Reuter, Frederick A. Stresen-Reuter, Inc.; D. L. Clinton and R. H. Clinton, Jr., Clinton Co.; Dr. J. K. Stewart, Anderson-Prichard Oil; E. F. Heizer, Cyanamid.

Honored

Ernest T. Trigg, John Lucas Co. head, and now in Washington as president of the newly formed National Paint, Varnish and Lacquer Association, was honored at a dinner by members of the Philadelphia Paint, Oil and Varnish Club on Nov. 20. Mr. Trigg at one time was president of the club.

Neal of S.-W. Dined

Sherwin-Williams' general production manager, C. S. Neal, was honored at a dinner Nov. 6. He has completed 25 years with S.-W. In 1908 he went with Acme White Lead and finally rose to general production manager. In '20

when S.-W. acquired Acme he became general superintendent of all paint and varnish plants.

Hercules New Resin

Vinsol, new Hercules Powder resin, was announced Nov. 8 by officials of the naval stores dept. Known as Vinsol Resin No. 1, new product is a hard, black, tough, non-tacky, oil-resistant resin for use in insulating varnishes, impregnating compositions, lacquers, emulsion paints, and thermoplastics, especially as a raw material for thermoplastics of the phenol-formaldehyde type.

Characteristics of the new material differ widely from other resinous compounds in that it is insoluble in drying oils and most varnish thinners, is soluble, however, in lacquer solvents, is harder and tougher than rosin and is not tacky at normal temperatures. It may be plasticized with castor oil without appreciable effect on its insolubility in petroleum oils.

Vinsol has good dielectric properties, according to Hercules authorities, and will be useful in many types of insulation and sealing compounds.

Paint Prices Advance

Finished paint prices finally caught up with higher raw material costs under NRA. Du Pont announced higher prices Nov. 23, and Devoe & Raynolds notified trade on the same date that early in December it will advance prices about 7½%. This follows an increase in prices last June of about 5% and makes total advance this year between 12-13%. It is expected that advances will also be made in lacquers.

Devoe & Raynolds Extra

Devoe & Raynolds Co. declared Nov. 23 extra dividends of 25c each on Class A and B common stock, and placed both classes on a $1 annual basis by declaration of quarterly dividends of 25c each on both issues. Company also declared regular quarterly dividends of $1.75 each on 1st and 2nd preferred stocks. All dividends are payable Jan. 2 to stock of record Dec. 20. These are the 1st payments on the common since April 1, 1932, when the stock received 15c quarterly.

Lacquer and Health

British inquiry into effects on health of exposure to cellulose lacquers has continued according to the *Chemical Trade Journal* (British). Clinical and haematological examinations have proved negative in so far as demonstrating definite illness; nevertheless, they do emphasize that vigilance in maintaining a good standard of ventilation and a reasonable temperature (this latter particularly in aeroplane works) is required. It is interesting to note that an inquiry in France into cellulose spraying found no evidence of ill-health attributable to the work where good conditions existed.

Lacquer exports from Germany in first half of this year amounted to 3,225 metric tons, compared with 3,187 tons in corresponding period in 1932.

Hoboken White Lead & Color Wks., Hoboken, N. J., has been fined $500 by U. S. Circuit Court of Appeals, 2nd Circuit, N. Y. City, for violation of that court's decree which was based on Federal Trade Commission's order requiring company to stop misrepresentations in the sale of its products.

In granting Commission's recent motion to punish for contempt in violating court decree of Jan. 19, 1931, court held corporation "guilty of contempt by its wilful conduct."

Commission order upon which the court decree was based, prohibited use of "White Lead" or words of like import in labeling, advertising or discribing paint products containing less than 50% of white lead, lead carbonate, or lead sulfate.

September Paint, Varnish and Lacquer Statistics

September sales of paint, varnish and lacquer products totaled $19,097,803 in value (586 producers). This compared with $20,620,811 in August and $16,805,712 in September last year. January-September sales were $171,426,583, against $165,753,600 in corresponding period of 1932.

		Classified sales reported by 344 establishments				
		Industrial sales				
1933	*Total sales reported by 586 establishments*	*Total*	*Paint and varnish*	*Lacquer*	*Trade sales of paint, varnish lacquer*	*Unclassified sales reported by 244 establishments*
1933—Jan....	$11,275,396	$3,529,886	$2,386,947	$1,142,939	$4,168,260	$3,577,250
Feb....	11,665,734	3,423,033	2,445,378	977,655	4,771,706	3,470,995
March.	13,578,568	3,391,947	2,484,550	907,397	3,788,213	4,398,408
April..	19,043,787	4,677,309	3,143,803	1,533,506	8,582,411	5,784,067
May...	26,241,044	5,991,938	4,298,455	1,693,483	11,788,573	8,460,533
June...	27,813,233	6,827,509	4,832,551	1,994,958	2,443,998	8,541,726
July...	22,090,187	6,406,184	4,493,516	1,912,668	8,627,400	7,056,603
August	20,620,811	6,323,475	4,754,701	1,568,774	7,840,359	6,456,977
September	19,097,803	5,544,686	3,975,917	1,568,769	7,462,113	6,091,004
1932—Jan....	$15,894,506	Comparative data not available				
Feb....	16,270,822					
March.	19,089,005					
April..	22,612,193					
May...	24,981,441					
June..	19,637,358	4,685,399	3,617,719	1,067,680	8,734,330	6,217,629
July...	14,430,122	3,793,245	2,900,707	892,538	6,058,813	4,578,064
Aug...	16,032,441	3,851,028	3,057,096	793,932	6,918,659	5,262,754
Sept...	16,805,712	3,980,564	3,113,303	867,261	7,216,748	5,608,400
Oct....	15,592,377	3,996,500	3,036,323	960,177	6,610,011	4,985,866
Nov...	12,492,818	3,599,319	2,639,362	959,957	5,196,766	3,696,733
Dec....	9,484,520	3,222,770	2,186,706	1,036,064	3,506,715	2,755,035
Totals, yr..	$203,323,315	....	....	....	....	....
1931—Total..	278,442,170	....	....	....	....	....

Putty producers have formed the National Putty Manufacturers' Association with O. J. Biddle, Biddle Co., St. Louis, as president. Secretary is M. F. Conners, Wm. Conners Paint Mfg. Co., Troy, N. Y.

Prince Mfg. has appointed Landers-Segal Color, 78 Delevan st., Brooklyn, exclusive selling agents for N. Y. State, New England, Northern N. J., Virginia and West Virginia, on its line of dry earth colors and fillers.

Phillip L. Maury, formerly president of the Arco Co., has acquired an interest in and is now vice-president and treasurer of the Valle Co., Cleveland, (paints, varnishes and lacquers).

Debevoise Co. has appointed Julio F. Sorzano (formerly with Standard Varnish, Toch Bros., and the Arco Co.) as general manager.

Du Pont's new refrigerator finish "Dulux" is said to be meeting with immediate success. It has no tendency to chip, crack or flake. It resists even hammer blows and the staining effects of household oils, greases and acids.

Paint Co. Notes

Sherwin-Williams' linseed oil plant strike lasted 2 days. Local N. Y. City linseed market was surprised at arrival of 505 tons from Holland. Early this fall exchange was such as to favor such foreign purchases, even in face of a 4½c duty, but the trade supposed with European currencies now much higher in relation to the $ that importations were impractical. Shipment may have been contracted for some time ago. Glidden October sales were up 30% above '32. Sales for year ended Oct. 31 totaled $25,145,894, compared with $22,487,660 in previous year—an 11.8% increase. Jos. A. McNulty has doubled office space at 114 Liberty st., N. Y. City.

High Purity Litharge

Litharge of exceptionally high degree of purity is claimed produced by new Russian method, involving solution of the lead anode in a specially designed electrolytic cell, followed by separation of lead hydroxide and dehydration of the latter by precipitation with an alkaline solution. After washing with water to remove the last traces of electrolyte, the litharge is ready for use.

Anaconda has closed 2 units of its electrolytic zinc refinery at Anaconda, Mont., and 1 of its 8 units at Great Falls. Shortage of zinc concentrates available for treatment in that area has been reported.

Textile Chemicals

New Colors

Spring collection of 52 woolen colors, just issued by Textile Color Card Association to its members in advance swatch form, reflects significant new themes, which suggest effective fashion and merchandising promotion for the cruise and Southern resort season.

Textile Briefs

Textile Color Card Association reports issuance of the 1934 Spring Shoe and Leather Card; also the knitted outwear colors for Spring and Summer 1934. National Association of Woolen and Worsted Overseers celebrated 50 years of progress at the American House in Boston on Nov. 18. Celebrating the occasion *Fibre & Fabric* published (Nov. 18 issue) a very detailed history of the organization. Reliance Cleansing Corp., (Brown, Fraser & Black, City Bank Bldg., Syracuse) is a new corporation to do bleaching and finishing.

Rayon Notes

Rayon industry is said to be resigned to some sort of processing tax, probably 6c. November marked 7th anniversary of the beginning of the Bemberg Elizabethton plant. September rayon exports showed sharp decline; $154,771 in September, $264,456 in August and $278,173 in September, '32. September quarter world rayon production totaled 76,135 metric tons, an increase of 11,000 over preceding quarter. Largest increase was in U. S., followed by Japan (now 2nd largest producer). From 80 to 85% of the output of 150 and 200 denier acetate and Canton crepes will be eliminated during 2 weeks December shutdown decided upon by 31 mills. Contending that there has been no shift from cotton to rayon in the weaving field as a result of the cotton processing tax, the National Rayon Weavers' Association has filed a new brief with the Dept. of Agriculture asserting that a compensatory tax on rayon weaving yarns would be unwarranted.

Paterson Chamber of Commerce Nov. 10 urged NRA to make Institute of Dyers and Printers' trustees code authority for silk and rayon finishing industry, declaring institute represented 75% of the industry.

New Sulfonated Oil Firm

W. J. Nelson and Wm. Taylor Stearns have formed Nelson-Stearns Co., with a plant at 410 Dorchester ave., South Boston, and have commenced production of a general line of staple sulfonated oils for the textile trade, softeners and finishers for all types of textile fibres of commercial consumption.

Important Price Changes
ADVANCED

	Nov. 30	Oct. 31
Albumen, egg	$0.88	$0.83
Dextrine, corn	3.62	3.47
British Gum	3.87	3.72
White	3.57	3.38
Divi Divi, pods, ship.	34.00	28.00
Gambier, plantation	.09½	.08½
Mangrove Bark	29.00	27.00
Myrobalans J1	32.00	31.00
J2	21.00	20.00
J3	21.00	20.00
Starch, powd.	2.81	2.69
Pearl	2.71	2.59
Valonia, beards	39.50	37.00
cups	25.00	23.00
Wattle Bark	35.00	30.50

Mr. Nelson is in charge of manufacturing, while Mr. Stearns is business manager.

Carbic Color Releases

Carbic Color & Chemical has recently issued a new pattern card entitled "Indigisol Prints on Cotton Material." This card illustrates all the indigosols brought out so far with the exception of the recently introduced Indigosol Grey IBL. Colors are shown printed in 2 depths and complete details concerning the methods of application and fastness qualities are given. Copies of this card may be obtained on request.

Logwood Trade

Data showing U. S. foreign trade in logwood extract during 1st 9 months of '33 when compared with figures of '32 indicate a slight trend toward an increase in imports and a decrease in exports. Statistics for U. S. production, imports and exports of logwood extract in recent years are shown below (000 omitted):

Year	*Production*		*Imports*		*Exports*	
	(†)	(‡)	(†)	(‡)	(†)	(‡)
1929..	19,338	$1,843	145	$23	2,025	$208
1930..	....	....	147	23	1,846	193
1931..	*17,032	*$1,251	365	49	1,602	165
1932..	....	....	169	21	960	103
1933, Jan.-Sept.	....	....	*196	*23	*853	*71

*Preliminary.
†Pounds. ‡Value.

Gardinol Flakes

Gardinol Corp. is now marketing flake products. Gardinol WA Double Flakes and Gardinol CA Flakes offer advantage of being non-dusting, more easily dispersed and more readily soluble.

Federated Textile Industries will be the name of the successor organization to the Silk Association of America. One of the 1st organizations to announce affiliation with the federation is the Textile Converters' Association of America.

Coal Tar Chemicals

Quiet Trading

Coal tar chemicals passed through a rather quiet 30 day period. Price changes were few. Phthalic anhydride was offered on a contract basis at a 1c advance. Imported crude naphthalene was up on the fluctuation of the exchange. Producers largely centered their activities on signing '34 business. Benzol and toluol prices were renewed. Ending of strikes in the textile and leather fields brought heavier purchasing to the front while the rate of operation in steel continued to hold coking operations down and stocks of crudes at a very low point.

National Aniline officials and Buffalo plant employes have signed an agreement averting a strike which had been threatening for several weeks.

Flotation Reagents

Canadian imports of panthates, cresylic acid and compounds of cresylic acid used in the process of concentrating ores, metals, or minerals totaled 979,920 lbs. ($171,968) during the 12 months ended March 31, 1933, compared with 1,328,020 lbs. ($221,276) in the corresponding period of 1931-32.

Important Price Changes
ADVANCED

	Nov. 30	Oct. 31
Naphthalene, crude, imp.	$1.96	$1.81
Phthalic anhydride, (cont.)	.14½	.13½

Of the 1933 fiscal year total U. S. supplied 947,683 lbs. ($171,089), as against 1,289,942 lbs. ($217,903) in previous year.

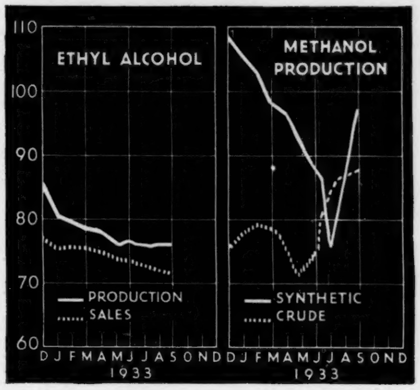
World Benzol Figures

According to statistics published by the Benzol Verband of Bochum, total world production of benzol last year was 725,000 tons, after the 900,000 tons of 1931 and the 1,150,000 tons of 1932. Following were the quantities produced in the various countries last year, figures for 1931 being given in brackets: Germany, 220,000 tons in 1932 (250,000 tons in 1931); U. S., 190,000 tons (280,000 tons); England, 100,000 tons (100,000 tons); France, 67,000 tons (77,000 tons); Holland, 21,000 tons (22,000 tons); Belgium, 34,000 tons (35,000 tons); Poland, 1,8000 tons (25,000 tons); Austria, 4,000 tons (6,000 tons); Spain, 4,000 tons (5,000 tons); Czecho-Slovakia, 15,000 tons (26,000 tons); and "other countries," 52,000 tons (74,000 tons).

SOLVENT NEWS

Reg. U. S. Pat. Off.

DECEMBER ★ A Monthly Series of Articles for Chemists and Executives of the Solvent-Consuming Industries ★ 1933



(*moving twelve-month averages,* 1931 = 100)

CURRENT PRODUCTION

ETHYL ALCOHOL		1933	1932
Pure	Jan.-Sept.	90,305	103,010
1000 proof	Sept. .	13,968	13,355
gallons	Aug. .	12,482	12,365
Sales	Jan.-Sept.	80,454	88,305
1000 proof	Sept. .	13,268	12,548
gallons	Aug. .	10,232	14,392
METHANOL			
Crude	Jan.-Sept.	2,092	1,699
1000	Sept. .	243	98
gallons	Aug. .	262	99
Synthetic	Jan.-Sept.	5,089	5,887
1000	Sept. .	1,461	698
gallons	Aug. .	860	793

CONSUMING INDUSTRIES TAKE LARGE DELIVERIES OF ALCOHOL

Different consuming industries have drawn heavily upon stocks of denatured alcohol in the last month. Anti-freeze requirements have taken seasonal amounts into consumption and demand from the rayon, lacquer, and other industries has held up well. Trading in forward positions was restricted because uncertainty about production costs made it difficult to establish an equitable trading basis. Recent developments, however, make it probable that industrial alcohol made from blackstrap will not be greatly affected.

As the anti-freeze trade offers a large outlet for denatured alcohol, weather conditions will be a market factor.

NEW LINE OF THERMOPLASTIC CEMENTS INTRODUCED

New thermoplastic cements recently introduced are of interest to a wide range of industries because of their usefulness for laminating or cementing many different types of materials. Fragile fabrics may be permanently joined to tougher backings for shoes, handbags; wood shingles may have an insulating lining of metal foil; Cellophane may be sealed irretrievably to metal foil liners; paper, wood, glass, cork, metal, foil, linoleum, fabric, veneer, may be affixed permanently to each other.

The solid ingredients of these products are composed of nitrocellulose or cellulose acetate plasticizers and synthetic resin of the modified polybasic-acid, polyhydric-alcohol type which are dissolved in suitable solvents. These cements are waterproof and very flexible; also they are resistant to the action of oils and grease, and are not affected by mild acid and alkaline solutions. They do not become brittle on ageing.

The cementing operation is accomplished by a simple application of heat. Surfaces to be joined are coated with the cement by means of brush, spraygun or coating machine.

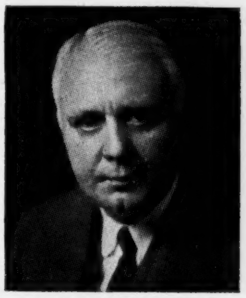
CHIEF CHARACTERISTICS OF AVAILABLE AND "IDEAL" CELLULOSE ACETATE PLASTICIZERS

Dimethyl and Diethyl Phthalates Gain Wide Acceptance Among Plastic Manufacturers

In the fabrication of cellulose acetate products, plasticizers are employed primarily to impart flexibility, although they may be expected to lower the melting point, decrease shrinkage, give flowing properties, reduce hygroscopicity, etc.

TRIGG HEADS NATIONAL PAINT, VARNISH & LACQUER ASSOCIATION

Congratulations and good wishes are extended to Mr. Ernest T. Trigg on his election as President of the National Paint, Varnish and Lacquer Association, and to the association itself for the high type of leadership it has secured.



Ernest T. Trigg

Realizing the necessity for united action, members of the American Paint & Varnish Manufacturers Association and the National Paint, Oil and Varnish Association voted at their annual conventions, held in Chicago the latter part of October, to amalgamate these organizations into a new association, to be known as the National Paint, Varnish and Lacquer Association.

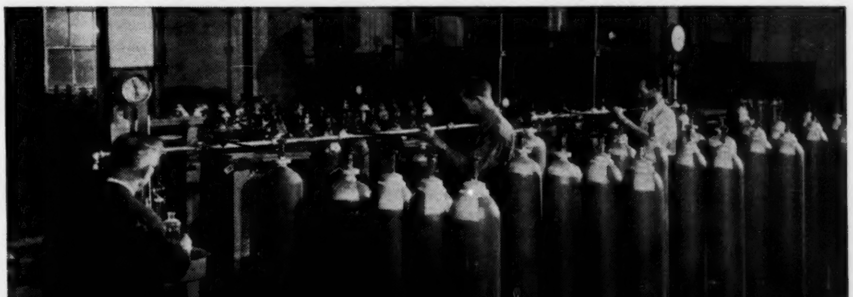
Mr. Trigg, who gives up his present position as president and general manager of John Lucas & Co., Inc., to assume his new office, has long been a dominant figure in the industry. He has also been active in paint trade association activities and during the past five months, as chairman of the General Code Committee of the Paint, Varnish and Lacquer Manufacturing Industry, has worked unceasingly in the preparation of the Code—following it through official channels until it was signed by the President October 31.

The "ideal" plasticizer should confer flexibility at both high and low temperatures, and possess the power of dispersing cellulose acetate. It should also have the features of high retentivity, compatibility with all raw materials, low vapor pressure, stability to light and heat, immiscibility with water, low inflammability, high dielectric strength and favorable cost. Color, taste, odor and toxicity should be absent.

Needless to say, the ideal plasticizer has not as yet been developed and there are but few materials which do more than approach accord with the complete requirements cited above. Fortunately, however, fabricators have found that not all these ideal characteristics are needed at one time—and that, depending on the type of finished product desired, single selections or combinations may be chosen which will give satisfactory results for the work at hand. Usually it is the case that combinations give better results than any one plasticizer alone.

Dimethyl and diethyl phthalates are probably the most popular and widely used of the cellulose acetate plasticizers, possessing as they do, the major necessary qualifications. This is particularly true from a cost standpoint, and because of the moderate price, plastic manufacturers find it to their advantage to use as large a proportion of the phthalate plasticizers as is possible. A considerable tonnage of these methyl and ethyl derivatives is used either alone or in combination with other plasticizers in the manufacture of sheeting, film, transparent paper, moulding powder and insulating lacquers. For laminating glass where clarity, stability to light and heat, and flexibility at low temperatures are essential, dimethyl

(*Continued on next page*)



FILLING ETHYLENE CYLINDERS: Filling room in the Ethylene department of U. S. I. Ethylene is a hydrocarbon gas derived directly from ethyl alcohol. It is compressed to about 1700 pounds per square inch and loaded into steel cylinders as illustrated. The major uses of Ethylene are for anesthesia, for fruit and vegetable conditioning and for cutting and welding operations. As a safe and effective anesthetic, Ethylene has made tremendous strides within the past few years.

Published Monthly by the U. S. Industrial Chemical Co., Inc.

DECEMBER ★ **SOLVENT NEWS** ★ 1933

CHIEF CHARACTERISTICS OF AVAILABLE AND "IDEAL" CELLULOSE ACETATE PLASTICIZERS

(Continued from preceding page)

phthalate is found most adaptable.

Other cellulose acetate plasticizers which are commonly used with the dimethyl and diethyl phthalates are dibutyl phthalate, triphenyl- and tricresyl-phosphates, triacetin, diamyl and dibutyl tartrates, benzyl alcohol and some of the sulphonamides and sulphonanilids offered under the trade name "Santicizer."

The literature contains many references to other products which have been suggested for this purpose should the reader care to pursue the subject further.

NEW BASE FOR PHENOLIC RESIN MOULDING AND LAMINATING

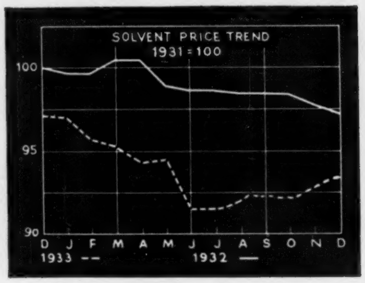
This new material consists of composite sheets having a sheet steel backing and a resin veneer surface. The surface coating is applied by means of an intermediate coating of fibrous material attached directly to the steel sheeting by means of a low-melting alloy. The phenolic resin is then attached to the prepared side by heat and pressure.

The veneer surfaces thus obtained show superior strength and adhesion, and are said to permit a great variety of surface effects and colors. It is stated that other resins may be used, and that the material is not restricted to sheeting but applicable to other shapes as well.

A process for the manufacture of rayons, as hardy as fabrics from silk, cotton or wool, has been reported. The claim is made that the rayon processed by this new method may be hot ironed, or soaped and washed in either hot or cold water and then hot ironed, because the process makes all rayon fabrics heat-proof.

* * *

Lump formation in swelling or dissolving finely divided substances such as gutta-percha, balata, rubber, soap powders, gums, resins, etc. may be prevented by retarding the rate of swelling or solution, according to a British Patent. The process consists of aggregating the substance into a powder of porous particles of larger grain size than the original after slightly moistening with a small proportion of liquid.



SOLVENT PRICE TREND

While there were some fractional declines in sales prices for petroleum solvents and diluents in some sections of the country, the market for solvents in general was firm with a tendency toward higher levels. Alcohol, both pure and denatured was firmly held.

The index number for prices is 93.35 which compares favorably with a revised number of 93.33 for the preceding month.

SIMPLE TEST FOR ADHESION OF PAINT TO METAL SURFACES

The following method for determining the adhesion of paint coats on metal surfaces is based on the conception that the adhesion of the primary coat is the all important factor.

The test itself is carried out by gluing wooden blocks upon the primary coat, cutting the paint around the block and then measuring the load required to tear off the block. In all cases a direct measure of the adhesion of the paint coat in grams per square centimeter can be obtained.

If the paint coat adheres too strongly, however, the glue itself will tear and in this case the only measurement possible is that the adhesion of the paint coat is greater than that of the glue.

TECHNICAL DEVELOPMENTS

Greater durability is imparted to varnishes containing China wood oil and linseed oil by the introduction of antioxidants to prevent the oxidation and drying of the linseed oil, without affecting the drying of the China wood oil. Such a varnish is said to dry in a few hours, yielding a hard, tack-free, glossy, water- and acid-resistant film. Resorcinol is a suitable antioxidant according to this German patent.

* * *

Weatherproof properties may be given transparent foils such as cellophane by coating with transparent lacquers. The weather proofing may be tested by loss of moisture from a moist material within a tightly enclosed membrane made of the foil.

* * *

A waterproofing treatment for fabrics without affecting their appearance, is said to permit men's suits, women's dresses, hats, silk hose, flags, etc. to be immersed in water without getting wet. It is expected to be useful for protecting the wings of airplanes against ice formation.

* * *

Damp surfaces may be made ready for painting by priming them with a mixture of alcohol and solvent naphtha containing a small amount of heavy oil or asphalt, according to reports of another German patent.

* * *

A new oil-resistant resin with good dielectric properties is offered for use in insulating varnishes, lacquers, emulsion paints and thermoplastics, especially of the phenol-formaldehyde type. It is hard, black, tough and non-tacky; insoluble in drying oils and most varnish thinners, but soluble in lacquer solvents.

* * *

A general purpose interior finish, available in several colors, claimed to be both acid and alkali-proof, and impervious to water, grease, oil or chemical fumes is now on the market. It may be used without primer on walls, floors or machines, requiring but one hour for drying.

* * *

A penetrating varnish, developed by a flooring manufacturer, seals the wood against absorption or moisture although it contains no waxes or non-drying oils. It is said to be equally suitable for an undercoat or finish, and does not flake, scrape off, scratch or mar easily.

* * *

An all-purpose filling machine handles paint, varnish, shellac, greases, food products, soap, etc. Features stressed by the maker are accuracy, quick change-over and cleaning accessibility. Speeds up to 40 units per minute are possible, with automatic or foot-pedal control.

* * *

A new inorganic resin, stated to be a clear glass-like material which is soluble in water but insoluble in organic solvents, oils, etc., is being produced commercially. It is said water solutions of this product resemble sodium silicate solutions in giving dry, glossy, flexible films but differ in being neutral and chemically unaffected by acids or alkalies.

Production Trends in Major Solvent-Consuming Industries

	October	*September*	*January-October 1933*	*January-October 1932*
CHEMICALS: index of production (1931=100)	102.6	100.5	92.9	88.5
LEATHER: index of production (1931=100)	....	103.4	107.7*	93.5*
LEATHER, ARTIFICIAL: pyroxylin spread, 1000 lb.	2,697	2,761	31,734	21,246
PAINT, VARNISH, and LACQUER: sales ($1000)	....	19,098	171,426*	165,754*
TEXTILE (Cotton) FINISHING: 1000 yd.	71,669	57,471	835,614	673,355

**January-September*

Fertilizers

Convention Well Attended

Fertilizer Code was the magnet that drew a record attendance (400) to the Atlanta N. F. A. convention Nov. 13-15. Said President John J. Watson in his opening address:

"Our industry is profitable only when agriculture succeeds. Our business is governed solely by the purchasing power of the farmer. He is and always will be the backbone of our great country, and only if he is prosperous can we be prosperous. To make his crops profitable he requires our products, which contribute as much to his success as the very elements with which he deals. Our industry is entitled to be regarded by him as his closest and most helpful friend. Fall tonnage reflects a renewed interest on the part of the farmer. He is not without hope, and for ourselves we look forward with confidence to the spring business. With the elimination of the destructive practices of the past and the determination to secure a reasonable profit, we should be able to restore our industry to a sound basis."

Speaking of the Code, Mr. Watson said "I would call your particular attention to Article VIII, 'Unfair Practices Prohibited.' A strict adherence on the part of the members of our industry in following these regulations will do more to restore our industry to a fair and profitable basis than any other feature in the Code. It is an opportunity never before presented, which, if we all enter into the spirit in which it is intended, should take our industry out of the class of ridicule and place it into the class of sound business. . . It is my earnest hope that the various zones will coordinate their work so that they will, as far as possible, adopt uniform methods, regulations, and rules. Otherwise, we shall have much conflict in border territories. The Code requires the Recovery Committee to establish procedure and to prepare uniform rules to guide the zones in their work."

Other speakers included Secretary Brand who reviewed the history of the making of the present Code, and Edmund B. Quiggle, general counsel of the N. F. A. who reviewed its legal aspects.

Convention was placed on record in a resolution as opposing the entry of the TVA into commercial fertilizer production and commending and approving any effort that may be made by TVA to discover and develop through experimentation any new processes for the production of new and improved fertilizers.

Recovery Committee Personnel

Fertilizer Recovery Committee, which is the Authority created to administer the Code, is composed of the following industry executives: John J. Watson, I. A. C., Chairman; Charles J. Brand; and in Zone 1: L. E. Britton, Consolidated Rendering, Boston, and E. H. Jones, Apothecaries Hall, Waterbury, Conn. In Zone 2: Horace Bowker, A. A. C., T. E. Milliman, Cooperative G. L. F. Mills, Buffalo, and E. H. Westlake, Tennessee Corp., New York, N. Y. In Zone 3: B. H. Brewster, Jr., Baugh & Sons Co., Baltimore, Md.; C. F. Hockley, Davison Chemical; W. W. Price, Smyrna, Del.; and W. E. Valliant, Valliant Fertilizer, Baltimore,Md. In Zone 4: C.F.Burroughs, Royster Guano, Norfolk, Va., G. A. Holderness, V.-C., Oscar F. Smith, Smith-Douglass, Norfolk, Va., and Thomas H. Wright, Acme Manufacturing, Wilmington, N. C.

Zone 5: J. Ross Hanahan, Planters Fertilizer & Phosphate, Charleston, S. C., A. F. Pringle, Merchants Fertilizer Charleston, S. C., and J. D. Prothro, Aiken Fertilizer, Aiken, S. C., In Zone 6: H. B. Baylor, A. I. C., Atlanta, Ga.; J. E. Sanford, Armour Fertilizer, Atlanta, Ga., and A. D. Strobhar, Southern Fertilizer & Chemical, Savannah, Ga. In Zone 7: C. T. Melvin, Gulf Fertilizer Company, Tampa, Fla., and R. B. Trueman, Trueman Fertilizer, Jacksonville,

SEPTEMBER SULFURIC ACID PRODUCED BY FERTILIZER MAKERS

Production and Purchases

	Sept., 1933	*Aug., 1933*	*Sept., 1932*	*January-September 1933*	*1932*	*1931*
Produced by reporting establishments—						
Totals	134,370	131,492	61,152	899,256	633,076	1,112,736
Northern district	81,323	82,472	43,406	604,833	463,582	765,649
Southern district	53,047	49,020	17,746	294,423	169,494	347,087
Purchased from fertilizer manufacturers—						
Totals	17,765	29,102	11,846	135,180	73,134	*.....
Northern district	4,038	11,165	2,156	59,071	31,518	*.....
Southern district	13,727	17,937	9,690	76,109	41,616	*.....
Purchased from non-fertilizer manufacturers—						
Totals	23,604	21,804	4,652	132,729	101,521	218,976
Northern district	8,493	9,606	3,177	73,422	58,755	128,282
Southern district	15,111	12,198	1,475	59,307	42,766	90,694

Consumed in Fertilizer Manufacture and Shipments

	Sept., 1933	*Aug., 1933*	*Sept., 1932*	*January-September 1933*	*1932*	*1931*
Consumed by reporting establishments in manufacture of fertilizer—						
Totals	94,881	116,322	53,259	741,640	493,278	1,077,587
Northern district	37,047	51,698	26,692	383,295	289,007	627,988
Southern district	57,834	64,624	26,567	358,345	204,271	449,599
Shipments—						
To other than fertilizer manufacturers—						
Totals	38,327	41,970	23,261	278,855	199,125	306,766
Northern district	34,324	37,377	19,523	255,744	171,953	248,162
Southern district	4,003	4,593	3,738	23,111	27,172	58,604
To fertilizer manufacturers—						
Totals	31,215	16,511	7,139	145,615	121,910	*.....
Northern district	14,908	11,775	6,037	102,700	94,425	*.....
Southern district	16,307	4,736	1,102	42,915	27,485	*.....

Stocks on Hand

	Sept., 1933	*Aug., 1933*	*Sept., 1932*	*January-September 1933*	*1932*	*1931*
Totals	104,236	92,998	88,456	......	......	......
Northern district	74,689	67,114	69,139	......	......	......
Southern district	29,547	25,884	19,317	......	......	......

*Data not available.

(Quantities expressed in short tons; Northern district, States north of Virginia-North Carolina line; Southern district, States south of Virginia-North Carolina line.)

October Fertilizer Tag Sales

	Equivalent tons — October P. C. of 1932	1933	1932	1931	*January-October* P. C. of 1932	1933	1932	1931
South—								
†Virginia	138	29,174	21,137	28,775	109	301,471	277,034	378,129
North Carolina	93	17,482	18,833	10,440	127	854,553	673,555	994,545
†South Carolina	154	4,220	2,745	5,050	125	540,476	432,450	587,741
Georgia	1,623	2,565	158	395	110	392,930	356,012	685,250
†Florida	75	28,200	37,645	27,412	88	249,182	284,551	312,889
Alabama	...	......	650	600	134	271,650	203,100	418,100
Mississippi	...	......	10	150	103	86,017	83,626	195,736
†Tennessee	173	7,760	4,490	5,822	121	76,248	62,948	118,896
‡Arkansas	400	200	50	......	126	21,790	17,348	61,046
†Louisiana	101	9,670	9,650	11,620	115	53,214	46,226	91,659
†Texas	84	600	712	750	94	30,790	32,860	62,807
Oklahoma	...	......	......	250	68	1,985	2,925	7,089
Totals, South	104	99,871	96,080	91,264	116	2,880,306	2,472,635	3,913,887
Midwest—								
Indiana	181	4,125	2,281	2,875	122	97,756	80,259	165,924
Illinois	388	1,272	328	1,074	86	10,128	11,734	30,584
Kentucky	215	3,575	1,665	1,700	106	58,272	55,221	105,172
Missouri	173	3,900	2,256	3,735	124	32,410	26,177	48,783
Kansas	80	238	298	50	69	1,730	2,518	2,831
Totals, midwest	192	13,110	6,828	9,434	114	200,296	175,909	353,294
Grand totals	110	112,981	102,908	100,698	116	3,080,602	2,648,544	4,267,181

*Monthly records of fertilizer tags are kept by State control officials and are slightly larger or smaller than the actual sales of fertilizer. The figures indicate the equivalent number of short tons of fertilizer represented by the tax tags purchased and required by law to be attached to each bag of fertilizer sold in the various States.

†Cottonseed meal sold as fertilizer included.

‡Excludes 40,130 tons of cottonseed meal for January-October combined, but no separation is available for the amount of meal used as fertilizer from that used as feed.

Fla. In Zone 8: E. A. Brandis, Standard Chemical, Troy, Ala.; J. W. Dean, Knoxville Fertilizer, Knoxville, Tenn., and C. D. Jordan, Southern Cotton Oil, New Orleans, La. In Zone 9: P. H. Manire, Marshall Cotton Oil, Marshall, Texas, and C. D. Shallenberger, Shreveport Fertilizer, Shreveport, Ia. In Zone 10: J. A. Miller, Price Chemical, Louisville, Ky., and L. W. Rowell, Swift & Co., Chicago, Ill. In Zone 11A: Weller Boble, Pacific Auano & Fertilizer, Berkeley, Cal. In Zone 11B: George R. Clapp, Swift & Co., North Portland, Ore.

Sulfate Advanced

Domestic sulfate producers advanced quotations for the balance of the year to $25 a ton on Nov. 23 and importers immediately followed with a similar advance of $1. Prices for '34 have not as yet been announced, but, in most quarters, it is expected that another boost will be given, possibly another $1 or $2 a ton. Nitrate prices were unchanged, but some upward revision was momentarily expected in the trade. New Mexico potash producers extended the current discount of 5% off list prices through December and also announced a 2½% discount for January-February delivery. California producers and importers extended the 5% through December but did not make any statement on '34 prices. Organic ammoniates were much stronger and closed the month with net gains. Domestic bone materials were off slightly. Business in most items was largely a routine affair, but the general feeling in the market was one of optimism over '34 volume.

Association Notes

Northwestern Fertilizer Association has voted to become part of the N. F. A. American Society of Agronomy held annual meeting Nov. 16-17 at the Stevens in Chicago. California Fertilizer Association met at Los Angeles Nov. 20. Association of Official Agricultural Chemists at its 49th annual meeting planned to solicit private endowment of its research work by some private philanthropic foundation and elected a Canadian, R. Harcourt, Ontario Agricultural College, as president. N. F. A. has issued "Fertilizer Indus ry Zone List" so that each producer may comply with law by mailing to each competitor in his zone his price schedules. N. F. A. has issued 4 charts illustrating very clearly what each division of the industry must do in complying with the code.

Personnel Changes

A. A. C. has made T. H. Briggs Henderson, N. C. manager. James H. Brodie has resigned from A. A. C. and Vanco Guano. Company has opened an office at Norfolk with B. T. Sustare in charge. John L. Davis, former Rogers & Hubbard plant superintendent, is with L. D. Davis Co., Philadelphia glue and adhesives maker. He will head a fertilizer division. TVA has appointed Dr. Fred G. Cottrell (former director, Fixed Nitrogen Research Laboratory; also Perkin medalist in '19 for work on electric precipitation) as chief consulting chemist.

Important Price Changes

	Nov. 30	Oct. 31
ADVANCED		
Ammonium sulfate	$25.00	$24.00
Calcium nitrate	26.50	25.50
Hoof meal	1.55	1.45
Nitrogenous material,		
East	2.45	2.35
Western	1.90	1.75
Imported	2.65	2.50
Tankage, N. Y.	2.50	2.40
Chicago	2.00	1.75
Imported	3.00	2.65
DECLINED		
Fish scrap	$2.50	$2.60

New Sales Offices

A. A. C.'s N. Y. City sales offices are now at 114 Liberty st. Executive offices remain at 420 Lexington ave. Bowker Chemicals' (A. A. C. subsidiary) is now at the Lexington ave. address.

M. O. Wilson is now A. A. C.'s Baltimore manager succeeding late E. F. Daniel. J. H. Frach has been made assistant manager.

Virginia Fertilizer Law

Effective as of Jan. 1, 1934, Governor Pollard has issued proclamation effectuating changes in the Virginia fertilizer law as amended in the spring of 1932. These changes provide for stating guaranties as nitrogen instead of ammonia, registration in whole numbers, and the N-P-K order.

Bureau of Mines has just issued "Economics of Potash Recovery from Wyomingite and Alunite" by J. R. Thoenen (R. I. 3190). Contains a wealth of valuable statistical data.

V-C has appointed A. T. Dukes Baltimore manager, succeeding C. F. Sims who is at Carteret plant.

Southern Fertilizer & Chemical, St. Marys, Ga., is making heavy shipments of fish scrap.

Fertilizer Co. Notes

Two Smith-Douglas warehouses were destroyed by fire Nov. 1. Plant was untouched. Atlantic Fertilizer has been organized at Norfolk with W. B. Mann, president. I. A. C.'s idle plant at East Macon, Ga., was destroyed by fire with a $50,000 loss. Another warehouse loss was that suffered by Central Chemical, Baltimore. About 4,000 tons of raw chicken feed material was also destroyed. Atchinson, Topeka & Santa Fe is constructing new spur to Carlsbad's potash fields, principally to Potash Co. of America's shafts. New N. F. A. members: Central Oil & Fertilizer, Layton, N. C.; Etiwan Fertilizer, Charleston, S. C.; Fidelity Chemical, Houston; Gresham Berry Growers, Gresham, Ore.; Newhouse Chemical & Supply, Little Rock; South Jersey Farmers Exchange, Woostown; Swedesboro Supply, Swedesboro, N. J.; Trenton Bone Fertilizer, Trenton; Hazel Trading, Hazelhurst, Miss. G. Ober & Sons has moved offices to the foot of Hull st. in Baltimore to be nearer the plant. Wilson & Toomer's Jacksonville plant was seriously damaged by fire last month.

World Nitrogen Figures

World trade in nitrogenous fertilizers recorded for 1st time in 3 years expansion in 1932-33, total world sales rising to an estimated amount of 1,511,000 metric tons (N), as compared with 1,427,000 tons (N), in 1931-32; 1,473,000 tons in 1930-31; and 1,745,000 in 1929-30.

Estimated World Nitrogen Fertilizer Consumption

Year	*Non-European Countries*[1] *Thousand Tons (N)*	*European Countries*[2] *Thousand Tons (N)*	*Total World Thousand Metric Tons (N)*
1929-30	694	1,051	1,745
1930-31	587	886	1,473
1931-32	503	924	1,427
1932-33	562	949	1,511

[1]Including Russia, [2]Excluding Russia.

Nitrogen Fertilizer Consumption, Europe, by Types
(*Per Cent*)

Year	*Ammonia Types*	*Ammonia Nitrate Types*	*Nitrate*	*Cyanamide*	*Total*
1924-25	51	9	27	13	100
1928-29	41	15	28	16	100
1931-32	48	16	23	13	100

Nitrogen Fertilizer Consumption, non-Europe, by Types

Year	*Total Consumption (Metric Tons N)*	*Ammonia Types*	*Ammonia Nitrate Types*	*Nitrate*	*Cyanamid*
1924-24	399,000	43	..	53	4
1928-29	654,000	54	4	36	6
1931-32	503,000	79	1	15	5

Belgium and the Netherlands are the most intensive users of nitrogenous fertilizer, with a consumption of 25 to 30 kilo N per hectare, followed by Germany and Denmark, with 8 to 12 kilo per hectare. Norway, Sweden, England, France, Italy, Spain, and Czechoslovakia consume 2 to 5 kilos per hectare while Switzerland, Austria, Poland, Finland, and Greece average only between 0.7 and 1 kilo.

U. S. imports of nitrogeneous materials totaled 386,509 tons in first 6 months of this year. This compares with 294,342 tons imported in corresponding period in 1932 and 534,722 tons in first half of 1931.

	Tons 1933	*Tons 1932*
Ammonia sulfate	227,283	165,441
Calcium cyanide	39,204	34,688
Calcium nitrate	12,461	3,705
Guano	31,423	3,278
Dried blood	1,237	2,454
Soda nitrate	41,445	44,954
Urea and calurea	4,264	2,751
Ammonia sulfate-nitrate	......	75
Potash nitrate, crude	9,601	11,424
Other	19,591	25,572

Oils and Fats

Government Auction

A. A. A. on Nov. 22 accepted bids on 21,000,000 lbs. of inedible grease, prices ranging from 2¾-2⅞c per lb. P. & G. was the largest single buyer, taking 19,000,000 lbs. Average of 2¾c, basis Chicago, compares favorably with the open market.

Palm and coconut oils are likely to be taxed by the A. A. A. as commodities that compete with hog and pork products. It was recently shown in Washington that 80% of the imports of these oils go into soap. John B. Gorden, Washington representative of the technical users of these oils, has requested that imports for inedible purposes be exempted.

Association Directory Ready

Oil Trades Association of New York has issued 1933-1934 edition of its booklet, containing names and addresses of member firms, together with the names of the firms' representatives, lists of committees and officers and other data. Joseph C. Smith, Smith-Weihman Co. is secretary.

George E. Hand, formerly with Cook Swan, is with Balfour, Guthrie, 67 Wall st., N. Y. City, and will handle paint and varnish oils.

A. S. T. M. On Linseed Oil

A. S. T. M. Subcommittee on Linseed Oil has reported an abnormal condition the past year in that considerable oil crushed from domestic linseed is below minimum iodine value set by A. S. T. M. specifications. This condition appears to be due to 2 causes, 1st, abnormal weather conditions resulting in premature harvesting, and 2nd, planting of a flaxseed which produced oil with an iodine value lower than other types of seed. It is reported that those interested in flax development are discouraging planting of this type of seed. Subcommittee made no recommendations in the matter, but indicated that some of the linseed oil now on the market may be pure linseed oil and still be below A. S. T. M. requirements.

Rosin

Rosin markets showed very little change over the past 30 day period. Turpentine, on the other hand, gained ground. Buying of naval stores was largely a routine affair throughout the month, purchasing being held to immediate needs in most instances. Interest of the industry was centered on the A.A.A. Marketing Agreement meeting held in Jacksonville. Serious opposition on the part of a large group within the naval stores industry was manifested and the fate of the agreement is now very much in doubt.

October production of naval stores by steam distillation and solvent treatment of wood and stocks of these products on hand Oct. 31, according to data collected by the producers' committee, through Arthur Langmeier, Hercules Powder, secretary, were as follows:—

Production

	Rosin 500-lb. barrels	Turpentine bbls. (50 gallons)	Pine oil Gallons
Month of October	44,821	6,929	274,095
Total from Apr. 1, 1933	266,639	41,823	1,712,069

Stocks at Plants

Totals Oct. 31, 1933	65,957	11,526	.....
March 31, 1933	98,615	12,387	.....
Change	—32,658	—861	.....

Note—Rosin production and stocks include all grades of wood rosin.

Naval Stores Notes

D. A. Sapp, president, D. A. Sapp Co., also vice-president, Operators Factorage, was seriously injured in an automobile accident on Nov. 2. P. J. Rooney has been elected a director of Turpentine & Rosin Factors, succeeding the late J. L. Medlin. Robert Lee Taylor, 65, treasurer, Consolidated Naval Stores, Jacksonville, died Nov. 12.

Shellac

U. S., London and Calcutta shellac interests may combine in a comprehensive research plan. Hon. H. A. F. Lindsay, Indian Trade Commissioner, appearing as official representative of the Indian Lac Committee and the London Lac Enquiry Committee presented a plan of action to a committee of the U. S. Shellac Importers' Association headed by Louis Gillespie, Gillespie, Rogers-Pyatt, at a luncheon Nov. 14.

Important Solvent Price Changes

ADVANCED

	Nov. 30	Oct. 31
Petroleum Solvents		
Cleaners' naphtha, Gr. 3	$0.07	$0.06½
Lacquer diluents, Gr. 3	.08	.07½
Petroleum thinner, Gr. 3	.05½	.05
Rubber solv., Gr. 3	.06¾	.06¼

Flaxseed Crop No. 1

Three year comparison with October and September Estimates

	Condition Nov. 1 (%) 10-year aver., 1921-1930	1932	1933	Bushels — Harvested 5-yr. aver. 1926-30	Harvested (Revised) 1932	Estimated 1933*	Estimated Oct. 1 1933	Estimated Sept. 1 1933
Wisconsin	11.7	12.0	10.0	104,000	72,000	50,000	50,000	48,000
Minnesota	9.6	9.2	6.4	6,566,000	5,704,000	4,365,000	4,365,000	4,092,000
Iowa	9.9	9.0	7.0	180,000	171,000	147,000	147,000	147,000
Missouri	5.9	5.5	5.0	15,000	11,000	10,000	11,000	11,000
North Dakota	6.9	4.0	2.8	8,032,000	3,720,000	2,083,000	2,083,000	2,083,000
South Dakota	7.0	4.7	1.0	3,374,000	776,000	97,000	97,000	97,000
Nebraska	8.2	6.0	6.0	99,000	18,000	12,000	14,000	1,3000
Kansas	6.3	6.5	6.0	195,000	299,000	168,000	168,000	168,000
Montana	6.2	3.5	3.0	1,367,000	998,000	513,000	423,000	342,000
Wyoming	6.2	3.5	2.0	78,000	18,000	6,000	8,000	8,000
United States	7.5	5.7	4.2	20,011,000	11,787,000	7,451,000	7,371,000	7,009,000

*Smallest production since 1919 and yield per acre lowest on record. Continued drought, particularly in the Dakotas and Minnesota, is largely responsible.

Cottonseed Statistics*

	On hand Aug. 1	Produced Aug. 1 to Oct. 31	Shipped out Aug. 1 to Oct. 31	On hand Oct. 31
Crude oil, pounds—				
1933-1934	*51,269,417	431,980,151	358,893,328	*145,195,962
1932-1933	29,523,581	437,373,835	369,459,127	134,919,144
Refined oil, pounds—				
1933-1934	†676,331,574	‡292,339,542	....	†676,536,590
1932-1933	628,420,148	289,547,179	....	584,771,166
Cake and meal, tons—				
1933-1934	160,874	629,100	476,860	313,114
1932-1933	114,656	645,610	451,960	308,306
Hulls, tons—				
1933-1934	76,686	383,634	291,887	168,433
1932-1933	162,773	405,279	311,614	256,438
Linters, running bales—				
1933-1934	70,786	244,801	173,472	142,115
1932-1933	235,521	221,308	186,831	269,998
Hull fiber, 500-lb. bales—				
1933-1934	985	14,694	11,082	4,597
1932-1933	4,138	5,698	2,843	6,993
Grabbots, motes, etc., 500-lb. bales—				
1933-1934	3,216	10,127	6,878	6,465
1932-1933	15,250	6,899	5,807	16,342

*Includes 4,274,646 and 12,922,328 pounds held by refining and manufacturing establishments and 14,320,860 and 26,512,900 pounds in transit to refiners and consumers August 1, 1933, and October 31, 1933, respectively.

†Includes 5,498,953 and 5,604,170 pounds held by refiners, brokers, agents and warehousemen, at places other than refineries and manufacturing establishments, and 12,642,917 and 10,155,513 pounds in transit to manufacturers of lard substitute, oleomargarine, soap, etc., August 1, 1933, and October 31, 1933, respectively.

‡Produced from 318,539,749 pounds of crude oil.

Exports for Two Months Ended September 30

		1933	1932
Oil crude	pounds.	11,452	1,343,533
Oil, refined	pounds.	640,839	1,282,747
Cake and meal	tons of 2,000 pounds.	11,217	15,652
Linters	running bales.	24,171	26,402

Chemical Specialties

Shoe Polish Code

Code hearing for shoe and leather finish, polish and cement manufacturers on Nov. 28 before Deputy Administrator O. E. Roberts disclosed the fact that NRA officials would not accept a differential greater than 5c in the hourly wages between male and female employes. Code proposed 7½c. H. Webb Hyde, Boston Blacking & Chemical, Cambridge, Mass., and Dudley Palmer, B. F. Brown Co., Boston, are industrial advisors.

Insecticide Makers Meet

Lehn & Fink's W. H. Gesell is chairman of an insecticide & Disinfectant Association Committee to watch and report on the Tugwell Bill. A large part of the convention, Dec. 11-13 at the New Yorker, will be devoted to discussion of how this bill will affect the industry. W. J. Andree, Sinclair Refining, is general chairman of the convention committee.

New Regulations

Louisiana now requires agricultural insecticides that might be mistaken for food to be distinctly colored. Cleveland has banned and Detroit and Columbus are reported considering banning sale of household insecticides in retail stores. Liquid household sprays was subsequently exempted in Cleveland. Federal Specifications Board, Washington, has made new stove polish specifications (date, Feb. 1, '34). Copies (5c) are obtainable from Superintendent of Documents.

New Products

P. & G. has begun manufacture of a soapless lather shampoo for retailing through drug stores. This is the 2nd toilet article to be sold this way.

Du Pont has placed on the market a new line of thermoplastic cements, made from nitrocellulose or cellulose acetate plasticizers and synthetic resin of the modified polybasic-acid, polyhydric-alcohol type which are dissolved in suitable solvents. Products have a wide use for laminating and cementing.

Spray-X, 222 W. Adams st., Chicago, is introducing a liquid for window, automobile windshield, etc., cleaning. Heat from electric light bulbs release fragrant odors in disks of specially processed asbestos—Cando Corp., Cambridge, Mass. Brunswick-Balke-Collender, Chicago, has a new polish for Whale-Bone-Ite seats. Fumol, N. Y. City, has a new insecticide with a synthetic base, designed specially for vaporizing machines.

J. R. Watkins, Winona, Minn., is installing plant at Winnipeg branch for toilet soap production. Harriet Hubbard Ayer, 325 E. 34 st., N. Y. City, has two new products—a wave set lotion and new bath powder. Artic Bear Laboratories, 10 E. 43 st., has a brushless and latherless shaving cream. Granell Products, 10 E. 40 st., N. Y. City, is marketing "Kolo", a new powdered cleanser. Royal Soap, 505 W. 5 st., Kansas City, Dr. D. H. Reeder, president, has been organized to make laundry and toilet soaps. Scientific Laboratories, 104 N. Hillside st., Wichita, Kan., will manufacture cosmetics. Hanton Co., Pleasantville, N. Y., is marketing "Hanton" a protective hand skin cream for industrial as well as home use. Bison Chemical Mfg., Buffalo, organized to manufacture and distribute general line of household chemical products. "Melodine" is a new antiseptic (solution of free iodine in glycerine) marketed by Melodine Products, Los Angeles.

Also, Misner Products, 4611 Wabash ave., Detroit, is marketing a new and exceptionally strong adhesive with a metallic base. American Bleacher Products, Detroit, has a perfumed bluing. San-Laboratories, 8502 Mack ave., Detroit, is formed to manufacture chemical specialties. Kap Corp. 39 S. LaSalle st., Chicago, is marketing a small fire extinguisher filled with "Dugas". Universal Chemical, 176 Union st., Akron, is manufacturing double strength bluing.

Lye Manufacturers' Association, claiming to represent 85% of the industry, recently submitted a code to Washington and a hearing was held before Division Administrator Whiteside on Dec. 7.

Du Pont's Atlantic City Boardwalk featured a display of Rit Products' Instant Rit which contains du Pont dyestuffs and fast colors.

New Packaging

The Texas Co. a few years ago formed subsidiary, Texaco Salt Products, to handle production and sale of salt, calcium chloride, magnesium salts, products of brine wells whose primary purpose was to supply cooling vapors of distillation in oil refining operations. For past 2 years packaged salt has been sold in the Midwest. Shipments to California have recently been made and invasion of Eastern markets is contemplated. Cooking salt called "Cook Book Salt," marketed in a snappy red and green package imitating a book, and table salt marketed in the conventional round, pour-spout type container, also red and green in color, may become very shortly familiar sights east of the Mississippi.

"Zerone" (synthetic methanol) du Pont's contribution to anti-freezes is dressed up in a snappy looking 1-gal. can job. For those preferring denatured ethyl Company is marketing CD 5 without any special name, however.

Specialty Men Elected

Executive Committee of the Paper Shipping Container Group of the National Association of Purchasing Agents held its semi-annual meeting in N. Y. City on Dec. 1. James M. Berry, Drackett Chemical, presided. Benjamin Baylis, Rumford Chemical, is also a member of the committee.

Federal Trade Commission Orders

Federal Trade Commission has ordered Youells-Privett Exterminating, Plainfield, N. J., not to advertise in connection with the sale of rat poison that it will mummify carcasses and prevent odors. Commission also ordered Carman-Roberts, Pittsburgh alkali and detergent dealer, to discontinue, in the sale of its products, substitution or passing-off TSP as and for the mono-salt.

Here and There

O. P. Rubardt & Co. (tints and dyetablets) has a new plant at 5116 Ravenswood ave., Chicago. Griffin Mfg. Co. (Griffin shoe polishes) has purchased an 8-story factory at 410 Willoughby ave., Brooklyn. November *Soap* contains a splendid summary of new insecticide, germicide and disinfectant patents written by Dr. R. C. Roark, Insecticide Division, Bureau of Chemistry & Soils and also particularly well-known for his rotenone work. McLaughlin Gormley King's chief chemist, C. B. Gnadinger is assisting Yogoslavian government on pyrethrum. He will be gone about 2 months.

The 3-In-One Oil Co. has adopted a new can and carton. Rit (Rit Products, Chicago) is now a powder-wafer instead of a soap. Washoff is a new material for the hands that work with tools (Washoff Co., Salt Lake City). Jefferson Island Salt, Louisville, is marketing a packaged salt—Old Rip Salt. Columbia Alkali reports large sales of Col-Rec (a coal rectifier.) McCormick & Co., Baltimore insecticides and specialties manufacturer, held an all-day sales conference Nov. 6.

Z. D. Sappenfield, formerly with Raleigh Co., Freeport, Ill., is now assistant purchasing agent for Allen B. Wrisley, Chicago. B. J. Schoenberg is now eastern division manager for U. S. Sanitary Specialties.

Wilson & Bennett Mfg. Co. (Chicago manufacturer of steel shipping containers) held a sales convention Nov. 2-4, 1st in 3 years.

The Financial Markets

Dividend Increases

Several dividend rate increases among chemical companies served to give the year-end a "Santa Claus" effect, quite unexpected at least by the rank and file of the stockholders. Outstanding, of course, was the du Pont extra (75c) added to the regular (50c) to 50,000 common holders, making $2.75 for the year. It is payable Dec. 15 to holders of record Nov. 29.

Said President Lammot du Pont:

"Distribution of earnings to common stockholders brings total dividends for year to $2.75 a share, which happens to be the same as the dividend paid for '32, and will amount to a distribution of approximately 90% of the estimated earnings for the year from all sources on its common shares.

"It is of further interest to note that dividends declared for 4-year period '30 to '33, inclusive, have been substantially equal to earnings over the same period.

"Under the circumstances the board of directors have felt that this somewhat greater dividend distribution than might be customary, was well warranted in the interest of stimulating business activity by contributing this added aid to the purchasing power of its some 50,000 common stockholders."

Texas Gulf Sulphur also joined the "select" circle of higher dividend payers when the Board declared a dividend of 50c, payable Dec. 15 to stock of record Dec. 1, 4th distribution for 1933. Three previous payments for year were 25c each on March 15, July 15 and Sept. 15.

Penick & Ford declared an extra dividend of $1 in addition to regular quarterly dividend of 50c, both payable Dec. 15 to stock of record Dec. 1. On Aug. 1 P. & F. increased dividend to 50c a share quarterly from 25c and paid an extra dividend of 50c at that time. With two quarterly dividends of 25c each paid earlier in the year, total disbursements for '33 will be brought up to $3 a share.

Pittsburgh Plate Glass has declared quarterly dividend of 25c payable Jan. 2 to stock of record Dec. 9. This places stock on a $1 annual basis, against 60c previously.

Other companies to feature prominently in dividend news of the month were United Carbon, which raised the annual rate from $1 to $1.60; Hercules Powder, which declared an extra of 75c in addition to the regular 37½c; Hooker Electrochemical, which resumed payments on the preferred (last dividend was paid Dec. 31, '31); Hazel Atlas Glass, which declared a $1 extra; and Will & Baumer, pending official notification of elimination of Federal 5% tax on dividends, deferred action on quarterly dividend on the 8% preferred.

Monsanto's Extra

Monsanto's president, Edgar M. Queeny, announced Dec. 1 that in accordance with decision of the board of directors employes, as well as stockholders, will participate in the highly satisfactory earnings of the Company for the current year. Directors at their regular quarterly meeting declared an extra dividend of 75c a share in addition to regular dividend of 31¼c a share. Both dividends are payable Dec. 29 to stockholders of record on Dec. 10.

Employes Share Too

Directors also voted bonuses to all employes who are not already working under the Company's bonus plan. Employes who have been with the Company for a year or more will receive a full week's pay Dec. 22. Those who have been in employ of the Company for less than a year will receive proportionate bonuses. Executives, technicians, salesmen, foremen, and others whose contribution to the Company's earnings can be adequately measured have been working under a bonus plan for the past few years.

Payment of the regular quarterly dividend on Dec. 29 instead of on Jan. 2, as has been the custom in the past, will constitute a total dividend payment of $2.31¼ a share for 1933.

In issuing the statement, Mr. Queeny said:

"It is estimated that our 1933 earnings will not fall very short of $5.00 a share. Earnings for the 1st 9 months of the year were $1,519,704 or $3.51½ a share. Sales thus far in the 4th quarter have held up satisfactorily and our present position warrants action of the board of directors. Future dividend policy will depend upon conditions."

A 10% Appreciation

The stock market in November reversed the downward trend of the past few months and showed an appreciation of approximately 10% ($1,744,353,272), comparing with a loss of 9% in October and 10½% in September, according to the *N. Y. Times* compilation. Stocks declined 5% in November, '32 and showed a net loss in November, '31 also.

November's gain was largely the result of the fear of inflation gripping the country, the result of the Administration's embarking further along the lines of the "controlled or commodity dollar." However the advance must be attributed also in part at least to the slight betterment in a number of lines of trade in November over October and to the impressive number of companies either increasing or resuming or declaring extra dividends.

With the recovery last month of all the losses of October, the level of stock prices now stands 22% below the peak established in July and 64% above the lows of the year. It is still, however, 62% below the end of September, '29, although 126% above the low for the depression, made in '32.

From the end of September, '29, to the end of November, last, the market has advanced in 20 months and declined in 30. Since '29, the months of advance numbered 4 each in '30 and '31 and 5 in 1932, compared with 7 this year to date. The run of consecutive months of advancing prices this year—4—has not been equaled since '29, nor has the ratio of months showing advances to declines, with 7 to 4 so far this year, compared with 5 to 7 in '32, 4 to 8 in '31 and 4 to 8 in '30.

The following table shows the group changes in November. The net average gain for the chemical stocks does not show up as well for the past month as it did in a number of other months of '33.

	November, 1933	
Group and Number of Issues	*Avr. Net Change in Points*	*Change in Values*
Amusements (5)	+ .625	+ $3,733,767
Building equipment (9)	+2.597	+ 35,308,148
Business equipment (4)	+3.844	+ 23,748,095
Chain stores (14)	+1.348	+ 57,858,338
Chemicals (9)	**+ .847**	**+ 255,580,248**
Coppers (15)	+ .400	+ 41,054,319
Department stores (10)	+ .987	+ 11,924,838
Foods (19)	+ .625	+ 64,458,012
Leathers (4)	+ .500	+ 763,450
Mail order (3)	+4.958	+ 57,629,578
Motors (15)	+2.367	+ 367,452,874
Motor equipment (7)	+1.143	+ 6,135,192
Oils (22)	+1.358	+ 427,662,014
Public utilities (29)	+ .108	+ 77,155,657
Railroads (25)	+1.400	+ 112,282,806
Railroad equipment (8)	+1.719	+ 29,724,304
Rubber (6)	+2.229	+ 17,826,515
Steels (13)	+1.875	+ 115,162,396
Sugars (9)	+ .458	+ 5,771,146
Tobaccos (14)	+ .982	+ 33,121,575
Average and total 240 issues	+1.374	+$1,744,353,272

Price Trend of Chemical Company Stocks

	Oct. 31 Close	*Nov. 3*	*Nov. 10*	*Nov. 17*	*Nov. 25*	*Dec. 2*	*Close Nov. 29**	*Net Gain or Loss*	*1933 High*	*1933 Low*
Allied	127⅝	135½	132	139	140⅞	143	142		145½	70¾
Air Reduction	93⅝	100	101¾	105¼	104½	103	101¾	+14⅜	112	47½
Anaconda	13⅜	14¾	15¼	15⅝	15⅛	14½	14¾	+ 1⅜	22⅞	5
Col. Carbon	49	54	56	61	60	61½	60½	+11½	71½	23⅛
Com. Solvents	31½	34	33	32¾	29⅞	30⅝	30	— 1½	57¼	9
Du Pont	73⅞	79	79⅝	84	88	88¼	86⅛	+12¼	90⅛†	32⅛
Mathieson	36½	37⅝	40¼	43⅞	43	41½	41½	+ 5	46⅝†	14
Monsanto	63⅛	65½	72	73½	73¼	73	72	+ 8⅞	75⅜†	25
Std. of N. J.	40⅜	42⅞	43⅝	47	44⅜	46⅛	45⅛	+ 4¾	47½†	22¾
Texas Gulf S.	36	39	40¾	43⅜	42⅞	43⅝	42½	+ 6½	45¼†	15¼
U. S. I.	61¾	69¾	69½	66½	61½	60	59	— 2¾	94	13½

*Nov. 30, Thanksgiving Day; †New high on November.

Appreciation in the chemical group amounted to $255,580,248 as against a loss of $99,349,903 in October and a loss of $128,228,866 in September. November's gain did, therefore, more than wipe out the losses sustained in the 2 previous months. This record is better than in most of the other 20 groups. Not all of the chemical group showed gains, however. U. S. I. and V.-C. registered losses. Allied stood out in the entire list with a rise of 14⅜ points.

Company	*Net Gain*	*Appreciation*	*Depreciation*
Allied Chem & Dye	+14⅜	$34,518,515	....
Comm. Solvents ..	— 1½	....	3,957,280
Du Pont de Nemours.......	+12¼	135,554,641	....
Mathieson Alkali Wks...........	+ 5	3,252,180	....
Tex Gulf Sulphur..	+ 6½	16,510,000	....
Union Carbide & Carb...........	+ 7⅝	70,355,394	....
U. S. Industrial Alcohol.........	— 2¾	....	1,075,904
Virginia-Carolina Chem..........	— ⅛	....	60,159
Westvaco Chlorine Prod.............	+ 2¼	482,861	....
Total Appreciation ...		+$255,580,248	....

The net monthly changes in value of the chemical group (*N. Y. Times*) from January through November have been as follows:

	Increases	*Declines*
January..............	$39,652,757	....
February..............	....	$168,411,582
March..............	24,037,138	....
April..............	403,188,208	....
May..............	385,593,391	....
June..............	139,232,100	....
July..............	....	149,136,077
August..............	331,595,207	....
September..............	....	128,228,866
October..............	....	99,349,903
November..............	255,580,248	....
Total..............	$1,578,879,049	$536,126,428
Net Gain to date in '33	$1,042,752,621	....

Battle For Control of V.-C.

Temporary injunction against 8 recently elected V.-C. prior preference directors has been made "perpetual without bond" by Judge William A. Moncure in Chancery Court, Wilmington. James W. Gordon, counsel for the enjoined directors has asked suspension of the court order until an appeal can be prepared.

Temporary injunction restrained directors from taking any action pending determination of petition of Alfred Levinger, director of N. Y. City, who asked the court to declare illegal the recent election of 8 directors headed by George S. Kemp, of Richmond, and to order a new election.

The opinion of the court was in part as follows:—

My conclusion is that the 8 persons allegedly elected directors by the vote of the prior-preference stockholders on Oct. 11, 1933, were not properly elected because there was no lawful meeting of all stockholders, for the lack of a quorum, and for the further and greater reason that because of the fact that, of the 144,871 shares of prior-preference stock, some 88,000 plus shares are in the treasury of the company and are not outstanding,

Dividends and Dates

Name	*Div.*	*Stock Record*	*Payable*
Abbott Labs.........	.50	Dec. 16	Jan. 3
Allied Chem. & Dye, pf................	$1.75	Dec. 11	Jan. 2
Amer. Home Prods....	.20	Dec. 14	Jan. 2
Amer. Home Prods....	.20	Nov. 14	Dec. 1
Am. Smelt & Ref. 7% cum. 1st pf.........	$1.75	Nov. 3	Dec. 1
Archer-Daniels-Midland, com..........	.25	Nov. 20	Dec. 1
Armour & Co. of Del. pf................	$1.75	Dec. 10	Jan. 1
Colgate-Palm-Peet, pf.	$1.50	Dec. 11	Jan. 1
Columbian Carbon...	.50	Nov. 15	Dec. 1
Com'l Solvents.......	.30	Dec. 1	Dec. 30
Devoe & Raynolds, 1st pf................	$1.75	Dec. 20	Jan. 2
Devoe & Raynolds, 2nd pf................	$1.75	Dec. 20	Jan. 2
du Pont, E. I. de Nem.	.50	Nov. 29	Dec. 15
du Pont, E. I. de Nem. deb..............	$1.50	Jan. 10	Jan. 25
du Pont, E. I. de Nem. Ext..............	.75	Nov. 29	Dec. 15
Eastman Kodak.....	.75	Dec. 5	Jan. 2
Eastman Kodak, pf....	$1.50	Dec. 5	Jan. 2
Freeport Texas.......	.50	Nov. 15	Dec. 1
Freeport Texas, pf....	$1.50	Jan. 15	Feb. 1
Gen. Ptg. Ink, pf.....	$1.50	Dec. 15	Jan. 2
Gen. Ptg. Spec........	.15	Dec. 8	Dec. 22
Glidden pr pf........	$1.75	Dec. 14	Jan. 2
Glidden com..........	.25	Dec. 14	Dec. 30
Hazel Atlas Glass.....	$1.00	Dec. 16	Jan. 2
Hazel Atlas Glass Ext.	$1.00	Dec. 16	Jan. 2
Hercules Powd. Ext...	.75	Dec. 11	Dec. 22
Hercules Powd.......	.37½	Dec. 11	Dec. 22
Heyden Chem., pf.....	$1.75	Dec. 20	Jan. 2
Hygrade Sylvania....	.50	Dec. 9	Jan. 2
Hygrade Sylvania, cv. pf..............	$1.62½	Dec. 9	Jan. 2
Int. Salt............	.37½	Dec. 15	Jan. 2
Koppers Gas & Coke, pf................	$1.50	Dec. 12	Jan. 2
Mathieson Alkali.....	.37½	Dec. 8	Jan. 2
Mathieson Alkali, pf..	$1.75	Dec. 8	Jan. 2
Merck, pf............	$2.00	Dec. 16	Jan. 2
Monsanto Chem......	.31¼	Dec. 10	Dec. 29
Monsanto Chem. Ext.	.75	Dec. 10	Dec. 29
Nat. Lead...........	$1.25	Dec. 15	Dec. 30
Nat. Lead, pf. Cl. B...	$1.50	Jan. 19	Feb. 1
Nat. Lead, pf. A......	$1.75	Dec. 1	Dec. 15
Patterson Sargent....	.12½	Nov. 22	Dec. 1
Penick & Ford.......	.50	Dec. 1	Dec. 15
Penick & Ford, Ext....	$1.00	Dec. 1	Dec. 15
Pittsburgh Plate Glass	.25	Dec. 9	Jan. 2
Proctor & Gamble 5% pf...............	$1.25	Nov. 24	Dec. 15
Sherwin-Williams, pf..	$1.50	Nov. 15	Dec. 1
Spencer Kellogg & Sons	.25	Dec. 15	Dec. 30
Texas Gulf Sulphur...	.50	Dec. 1	Dec. 15
Union Carbide & Carb.	.25	Dec. 1	Jan. 1
United Carbon.......	.40	Dec. 13	Jan. 1
United Carb. 7% pf...	$3.50	Dec. 13	Jan. 1
United Dyewood, pf...	$1.75	Dec. 20	Jan. 2
Westvaco Chlorine Prod.	.10	Nov. 15	Dec. 1
Westvaco Chlor. Prod. pf..............	$1.75	Dec. 15	Jan. 2

Annual and Special Meetings

	Record Date	*Meeting Date*
Glidden Co...............	Dec. 28	Jan. 18
Socony-Vacuum (special).....	Nov. 17	Dec. 14

leaving some 56,000 shares outstanding, which number of shares is $5,600,000 par amount, therefore less than $10,000,000 par amount by the terms of Section 5, Article 4 of the charter.

Directors must now be elected by the vote of all classes of stock, each share having 1 vote.

V.-C. junior shareholders failed Nov. 10 for 3rd time in 2 years to muster a quorum and annual stockholders meeting was adjourned to Dec. 9. Prior-preference group had a quorum as usual.

Election of a new V.-C. board will await decision of the Supreme Court of Appeals of Virginia on the appeal from the recent decision of Judge W. A. Moncure in Chancery Court denying the right of the prior preference group of stockholders to name a majority of the directors.

Old board Nov. 24 adopted recommendation of President George A. Holderness that election of officers be postponed until after stockholders finally name a new board of directors.

Carolina Dyeing & Winding, Inc., Boston, has been chartered with a capital of 1,500 preferred and 3,000 common. President, Edward G. Griffin; treasurer, William H. Gulliven, Jr., 39 Kirkland st., Cambridge, and Arthur L. Kobson, Jr.

Over the Counter Prices

	Sept. 30		**Oct. 31**		**Nov. 29**	
American Hard Rubber......	8	12	8	12½	7½	11
Dixon Crucible..	40	48	37	42½	32	37
Merck, pfd.....	98	101½	101½	105½	101½	105½
Worcester Salt..	..	..	47½	53	47¾	53½
Young, J. S. pfd.	82½	..	82½	..	83	..
Young, J. S.com.	59	..	57½	..	57½	..

Foreign Markets

London	**Oct. 2**	**Oct. 31**	**Nov. 30**
British Celanese.....	15s 3d	15s 6d	12s 10½d
Celanese............	£9¼	£8⅝	£8⅜
Courtaulds..........	£2	£2⅛	£2⅛
Distillers...........	82s 6d	82s 9d	80s 6d
I. C. I..............	29s 9d	30s 3d	30s 6d
Un. Molasses	13s	13s 10¼d	13s
Paris			
Kuklmann..........	650	650	630
L'Air Liquide.......	770	760	770
Berlin			
I. G. Farben........	116	116	126¼
Milan			
Montecatini.........	119¾	119¾	129½

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of Chemical Industries, published monthly at Pittsfield, Mass.

State of New York, County of New York—ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Williams Haynes, who, having been duly sworn according to law, deposes and says that he is the Publisher of Chemical Industries, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse side of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Williams Haynes, 25 Spruce St., New York, N. Y.; Business Manager, William F. George, 25 Spruce St., New York, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Chemical Markets, Inc.; 25 Spruce St., New York, N. Y.; Williams Haynes, 25 Spruce St., New York, N. Y.; William F. George, 25 Spruce St., New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state). None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

Williams Haynes, Publisher.

Sworn to and subscribed before me this 28th day of September, 1933. Thomas A. Cruger, Notary Public, N. Y. Co. Clerk's No. 55 N. Y. Reg. No. 3,024 Comm. Expires, March 31, 1935.)

Earnings at a Glance

Company	Annual Dividends	Net Income 1933	Net Income 1932	Common Share Earnings 1933	Common Share Earnings 1932
Am. Agricultural Chemical:					
September 30, quarter....	f....	†231,909	†353,132	....	....
Amer. Commercial Alcohol:					
September 30 quarter.....	f....	85,404	160,417	h.32	h.82
Nine months, Sept. 30....	f....	218,513	404,822	h.83	h2.08
Amer. Zinc, Lead & Smelt. Co.:					
September 30 quarter.....	f....	$82,370	$5,540	p$1.06	p$.07
Nine months, Sept. 30.....	f....	206,485	†39,816	p2.67	....
Archer-Daniels-Midland:					
September 30 quarter.....	1.00	364,302	206,163	.55	.26
California Ink Co.:					
Year, September 30.......	$2.00	$156,522	$179,441	h$1.61	h$1.65
Certain-Teed Products Corp.:					
September 30 quarter.....	f....	2,553	†367,517	p.04	....
Nine months, Sept. 30....	f....	†727,358	†1,208,230	....	....
Columbian Carbon Co.:					
September 30 quarter.....	2.00	291,678	199,418	.54	.37
Nine months, Sept. 30....	2.00	777,978	669,363	1.44	1.24
Continental-Diamond Fibre:					
September 30 quarter.....	f....	15,375	†181,644	.03	....
Nine months, Sept. 30....	f....	†145,065	†503,505	....	....
Formica Insulation Co.:					
September 30 quarter.....	f....	26,253	†6,129	.14	....
Nine months, Sept. 30....	f....	†7,272	†20,411	....	....
International Nickel:					
September 30 quarter.....	f....	3,773,130	†199,097	.22	....
Nine months, Sept. 30....	f....	5,636,019	†292,352	.28	....
Liquid Carbonic Corp.:					
Year, September 30.......	f....	366,913	†440,529	1.05	....
Molybdenum Corp. of Amer.:					
September 30 quarter.....	f....	70,862	†24,049	....	....
Nine months, Sept. 30....	f....	106,118	†40,577	....	....
New Jersey Zinc Co.:					
September 30 quarter.....	2.00	1,514,909	516,330	.77	.26
Nine months, Sept. 30....	2.00	2,885,290	1,595,329	1.47	.81
Penick & Ford, Ltd.:					
September 30 quarter.....	§2.00	351,081	287,461	.88	.72
Nine months, Sept. 30....	§2.00	1,048,671	561,872	2.62	1.40
Spencer, Kellogg & Sons:					
Year, September 2........	1.00	491,402	†132,737	.98	....
Standard Oil Co. of Calif.:					
September 30 quarter.....	z.25	4,674,103	5,096,842	.36	.39
Nine months, Sept. 30....	z.25	5,873,516	12,013,385	.45	.92
United Carbon:					
Sept. 30 quarter..........	1.00	178,916	34,039	....	....
Nine months, Sept. 30....	1.00	479,647	138,675	....	....
Vulcan Detinning:					
September 30 quarter.....	f....	70,393	33,648	1.33	.19
Nine months, Sept. 30....	f....	165,389	89,823	2.58	.22
Westvaco Chlorine Products:					
September 30 quarter.....	.40	125,191	100,628	.30	.22
Nine months, Sept. 30....	.40	324,789	277,206	.73	.57

fNo common dividend; †Net loss; hOn shares outstanding at close of respective periods; pOn preferred stock; §Plus extras; zLast dividend declared.

Company Reports

Carbide Doubles Last Year's Earnings

Union Carbide reports for quarter ended Sept. 30, net profit of $4,603,663 after interest, federal taxes, depreciation and preferred dividends of subsidiaries, equivalent to 51c a share on 9,000,743 no-par shares of stock. This compares with $2,642,745 or 29c a share in preceding quarter and $1,984,917 or 22c a share in September quarter of previous year.

For 9 months ended Sept. 30, 1933, net profit amounted to $8,904,873 after charges, taxes, etc., equal to 99c a share comparing with $6,221,354 or 69c a share in 1st 9 months of 1932. Consolidated income account for quarter ended Sept. 30, 1933, compares as follows:

	1933	1932	1931	1930
Net aft fed tax........	$6,594,979	$4,045,996	$6,927,477	$9,508,731
Int & sub pf divs......	299,599	305,293	311,863	336,999
Depr, etc..............	1,691,717	1,755,786	1,842,529	1,963,053
Net profit...........	$4,603,663	$1,984,917	$4,773,085	$7,208,679

Nine months ended Sept. 30:

	1933	1932	1931	1930
Net aft fed tax........	$14,804,107	$12,364,820	$20,311,640	$26,865,969
Int & sub pf divs......	902,714	919,709	940,346	967,438
Depr, etc..............	4,996,520	5,223,757	5,478,384	5,910,267
Net profit..........	$8,904,873	$6,221,354	$13,892,910	$19,988,264

A. A. C. (Delaware) and subsidiaries report for quarter ended Sept. 30, net loss of $231,969 after depreciation, depletion and reserve for insurance, comparing with net loss of $353,132 in Sept. quarter of '32.

	1933	1932
Gross profit from operations..........................	$161,465	$14,437
Expenses, etc..	231,691	204,585
Depreciation and depletion............................	134,126	139,963
Reserve for insurance.................................	27,557	23,021
Net loss..	$231,909	$353,132

Hercules Earns $2.02 In 9 Months

Hercules Powder reports for 9 months ended Sept. 30, net profit of $1,731,015 after depreciation, federal taxes, etc., equivalent after dividends paid on 7% preferred stock, to $2.02 a share on 582, 679 no-par shares of common, excluding 23,585 shares held in treasury. This compares with $538,587, or $5.06 a share, on 106,339 shares of 7% preferred in 1st 9 months of '32.

For quarter ended Sept. 30, net profit was $837,964, after charges and taxes, equal to $1.12 a share on 582,679 common shares comparing with $666,072, or 83c. a share on 582,679 common in preceding quarter and $238,371, or 9c. a share on 582,579 common in 3rd quarter of previous year.

Income account for 9 months ended Sept. 30, compares as follows:

	1933	1932	1931	1930
Gross..................	$15,803,283	$12,815,073	$15,523,274	$20,416,664
*Net profit............	1,731,015	538,587	1,087,886	2,160,260
Pfd divs...............	554,904	562,276	599,765	599,765
Com divs...............	655,522	950,097	1,361,660	1,353,118
Surplus............	$520,589	†973,786	†$873,539	$207,377

*After expenses, depreciation, federal taxes, etc. †Deficit.

Corn Products Ahead of '32

Corn Products Refining Co. reports for 9 months ended Sept. 30, net income of $8,098,406 after charges, depreciation and federal taxes, equivalent after dividend requirements on 7% preferred, to $2.68 a share (par $25) on 2,530,000 shares of common. This compares with $6,465,004 or $2.03 a share in 1st 9 months of 1932.

For quarter ended Sept. 30, net income was $2,909,677 after charges and taxes, equal to 98c a share on common comparing with $3,090,116 or $1.05 a share in preceding quarter and $2,311,-623 or 74c a share in September quarter of previous year.

	1933	1932	1931	1930
*Net earns............	$7,637,558	$6,203,673	$6,613,213	$10,130,477
Other inc.............	2,101,844	2,127,555	3,032,069	2,369,450
Total inc...........	$9,739,402	$8,331,228	$9,645,282	$12,499,927
Int, depr, etc........	1,640,996	1,866,224	2,091,563	2,329,585
Net income..........	$8,098,406	$6,465,004	$7,553,719	$10,170,342
Pfd divs..............	1,312,500	1,312,500	1,312,500	1,312,500
Com divs..............	‡5,692,500	5,692,500	6,957,500	6,957,500
Surplus.............	$1,093,406	†$539,996	†$716,281	$1,900,342

*After expenses, estimated federal taxes, etc. †Deficit. ‡Excludes 1% stock dividend amounting to $1,402,632.

Southern Fertilizer and Chemical and subsidiaries have reported net loss of $32,809 for the fiscal year ended May 31, 1933, after interest, amortization, reserve for bad debts and other charges.

Columbian Carbon Makes Favorable Report

Columbian Carbon and subsidiaries report for 9 months ended Sept. 30, net income of $777,978 after taxes, depreciation, depletion and minority interests, equivalent to $1.44 a share on 538,420 no-par shares of stock. This compares with $669,363 or $1.24 a share in 1st 9 months of '32.

For quarter ended Sept. 30, net income was $291,678 after taxes and charges, equal to 54c a share, comparing with $243,967 or 45c a share in preceding quarter and $199,418 or 37c a share in September quarter of previous year.

	1933	1932	1931	1930
Net aft fed tax............	$1,505,802	$1,472,126	$2,532,259	$3,372,506
Depr & depl................	738,944	843,297	1,160,723	1,169,421
Minority int...............	*11,120	*40,534	*34,479	164,630
Net income..............	$777,978	$669,363	$1,406,015	$2,038,455

Quarter ended September 30:

	1933	1932	1931	1930
Net aft fed tax............	$558,930	$439,695	$916,241	$873,344
Depr & depl................	244,358	242,735	361,355	390,976
Mniority int...............	22,894	*2,458	8,603	37,094
Net income.............	$291,678	$199,418	$546,283	$445,274

*Credit.

P. & G. earnings for 3 months ended Sept. 30 were equal to or slightly better than June quarter, when net profit was $3,738,572, or 54c a share.

The Industry's Securities

1933 November Last	High	Low	1933 High	1933 Low	1932 High	1932 Low	Sales In November	Sales During 1933	Stocks	Par $	Shares Listed	An. Rate		Earnings $-per share-$ 1931	1930
NEW YORK STOCK EXCHANGE															
101¼	109½	95½	112	47½	63½	30⅞	31,900	658,100	Air Reduction	No	841,288	$3.00		4.54	6.32
142	145½	†123⅞	145½	70¾	88¼	42½	72,900	2,401,500	Allied Chem. & Dye	No	2,401,000	6.00		6.74	9.77
119½	123⅝	117⅞	125	115	120†	96½	2,800	29,500	7% cum. pfd.	100	393,000	7.00			
22	25¾	20½	35	7¼	15½	3½	10,600	264,500	Amer. Agric. Chem.	100	333,000		Yr. Je. '30		Nil
47½	56¾	44⅛	89⅞	13	27	11	93,600	2,493,500	Amer. Com. Alc. (new)	20	375,000				d1.27
26⅞	27⅛	23½	29¼	9¾	15½	7	9,600	110,800	Archer Dan. Midland	No	550,000	1.00	Yr. Aug. 30		1.68
32	35¼	22¾	39⅛	9	25½	7*	12,400	142,000	Atlas Powder Co.	No	261,438			.59	2.67
78	80	76	83⅛	60	79½	45½	590	7,424	6% cum. pfd.	100	96,000	6.00			
60½	63	48¾	71½	23⅛	41⅞	13½	45,600	132,500	Columbian Carbon	No	538,420	2.00		3.02	5.04
30	35⅜	29⅜	57¼	9	13¾	3½	464,900	7,297,400	Comm. Solvents	No	2,530,000	.60		.83	1.07
69⅞	79¼	68½	90⅝	45⅜	55⅜	24¾	74,200	1,578,500	Corn Products	25	2,530,000	3.00		3.54	4.82
136½	138½	134	145¾	117½	140	99½	1,410	12,425	7% cum. pfd.	100	250,000	7.00			
86⅛	90⅛	† 72¾	90⅛	32⅛	59¾	22	452,100	5,783,160	DuPont de Nemours	20	11,008,512	2.00		4.29	4.67
106	113⅞	104¼	117	97½	105⅛	80¾	3,900	44,400	6% cum. deb.	100	1,098,831	6.00			
78⅜	80¾	68¾	89¾	46	87¾	35¼	41,400	598,918	Eastman Kodak	No	2,261,000	3.00		5.78	8.84
122	127¾	122	130	110	125	99	230	2,090	6% cum. pfd.	100	62,000	6.00			
46½	49⅜	41½	49⅜	16⅛	28⅝	10	67,200	823,200	Freeport Texas Co.	No	730,000	2.00		3.26	w4.77
60½	62⅞	48⅞	63	15	29½	13⅞	23,476	266,376	Hercules Powder Co.	No	606,234	1.50		1.04	2.61
109¼	109¼	104½	110	85	95	70½	280	4,570	7% cum. pfd.	100	114,241	7.00			
2⅜	2½	2	5⅜	⅞	3½	¼	4,500	163,100	Intern. Agric.	No	450,000		Yr. Je.'30		1.68
12¼	13½	12¼	27½	5	15	3¾	500	24,400	7% cum. prior pfd.	100	100,000	7.00	Yr. Je. '30		14.58
21¾	23¼	† 18½	23¼	6¾	12½	3½	891,500	8,324,037	Intern. Nickel	No	14,584,000			.22	.67
...	18½	15	22	7½	11	8	2,700	68,700	Kellogg (Spencer)	No	598,000	.60			h1.14
25	28½	22	50	10¼	22	9	19,300	841,200	Liquid Carbonic Corp.	No	342,000			2.96	5.22
41½	46⅝	† 36¼	46⅝	36¼	20⅞	9	70,100	558,200	Mathieson Alkali	No	650,426	1.50		1.88	2.96
72	74½	63½	75⅜	25	30¾	13⅜	15,500	202,466	Monsanto Chem.	10	429,000	1.25		2.98	1.73
138¾	140†	128⅞	140	43¼	92	45	5,200	37,200	National Lead	100	310,000	5.00			7.58
122	128¼	†122	128¼	101	125	87	1,300	6,855	7% cum. "A" pfd.	100	244,000	7.00			
...	103½	100	109⅛	75	105	61	• 200	3,630	6% cum. "B" pfd.	100	103,000	6.00			
...	5⅝	4¼	7¼	1⅜	4⅜	1	8,100	187,600	Tenn. Corporation	5	858,204	1.00			1.21
42½	45¼	35½	45¼	15¼	26¾	12	229,600	1,692,600	Texas Gulf Sulphur	No	2,540,000	2.00		3.52	5.50
45	49½	36⅝	51⅞	19¾	36⅜	15½	182,600	2,548,100	Union Carbide & Carb.	No	9,001,000	1.20		2.00	3.12
34½	35¾	23½	35¾	10¼	18	6⅝	85,700	670,900	United Carbon Co.	No	398,000			—	1.43
59	71⅞	57¼	94	13½	36¼	13¼	111,200	2,544,700	U. S. Ind. Alc. Co.	No	373,846			—	z2.96
21	21⅞	16⅛	36¼	7⅝	23¾	5¼	56,100	1,263,000	Vanadium Corp. of Amer.	No	378,367				2.95
3⅛	3⅞	3	7⅜	⅝	2⅜	½	4,800	355,800	Virginia Caro. Chem.	No	487,000		Yr. Je. '30		Nil
13½	14⅛	12⅛	26½	3⅜	11¼	3⅛	2,200	83,400	6% cum. part. pfd.	100	213,000		Yr. Je. '30		2.63
59	59¼	59	63½	35⅜	69¾	20	400	12,220	7% cum. prior pfd.	100	145,000		Yr. Je. '30		11.96
15½	16	13	20½	5	12⅝	1	3,100		Westvaco Chlorine Prod.	No		1.00		1.79	2.51
NEW YORK CURB															
12	13¾	9	15⅜	3¾	8½	1⅝	59,600	1,065,600	Amer. Cyanamid "B"	No	2,404,000			.21	
...	4	3½	4½	1	2⅛	¾	4,800	182,200	Brit. Celanese Am. Rcts.	2.43	2,806,000				
101½	106	101	110	27	55	8	1,325	30,669	Celanese 7% cum. part. 1st pfd.	100	148,000	7.00			
85	86	82¾	90	51	64¼	17	775	11,695	" 7% cum. prior pfd.	100	115,000	7.00			
17¼	21	16⅜	26⅞	2	5⅜	1⅛	5,400	77,200	Celluloid Corp.	No	195,000				
...	11⅝	10⅜	...	...	6⅞	4½	13,900	132,500	Courtaulds, Ltd.	1£					
...	71½	64	78	30	39	21⅛	5,100	57,000	Dow Chemical	No	630,000	2.00			3.44
4¾	5	4⅛	8	½	1½	¼	2,700	59,300	Duval Texas Sulphur	No	500,000				
...	18½	16½	19	8	...	...	700	6,600	Heyden Chemical Corp.	10	150,000	1.00			
...	8½†	6¾	8½	4⅞	2⅞	2¼	1,500	3,150	Imperial Chem. Ind.	1£				1.21	
16¾	18½	15¾	20⅝	8	20⅞	6¼	2,100	31,960	Shawinigan W. & P.	No	2,178,000	1.00			
CLEVELAND STOCK EXCHANGE															
...	...	...	...	...	25	21¾		811	Cleve-Cliffs Iron $5 pfd.	No	498,000	5.00		—	11.42
71	72	66	78	30	40	21½	681	13,955	Dow Chemical Co.	No	630,000	2.00			3.44
105	105	105	...	...	...	...	10	568	Dow Chemical Co., pfd.	100	3,000,000	7.00			
...	134	133	...	...	...	...	185	2,337	National Carbon, pfd.	100	5,600,000	7.00			
PHILADELPHIA STOCK EXCHANGE															
55	55	49	55	25¼	40	19⅞	750	5,590	Pennsylvania Salt	50	150,000	3.00	Yr. Je. '30		

1933 November Last	High	Low	1933 High	1933 Low	1932 High	1932 Low	Sales In November	Sales During 1933	Bonds	Date Due	Int. %	Int. Period	Out-standing $
NEW YORK STOCK EXCHANGE													
...	91⅛	86	94¾	70½	80	62	20	756	Amer. Cyan. deb. 5s	1942	5	A. O.	4,554,000
84	86	76½	89	64	80	54¼	409	3,486	Amer. I. G. Chem. conv. 5½s	1949	5½	M. N.	29,933,000
...	7	4⅛	14⅛	2⅛	18	1	77	1,194	Anglo-Chilean s. f. deb. 7s	1945	7	M. N.	14,600,000
54¼	58	54	74⅞	37	60	34½	43	402	By-Products Coke Corp. 1st 5½s "A"	1945	5½	M. N.	6,629,000
...	102⅛	101⅛	104½	100½	104⅞	100⅝	29	621	Corn Prod. Refin. 1st s. f. 5s	1934	5	M. N.	1,822.000
...	62	61½	65	38½	54⅞	32	5	243	Int. Agric. Corp. 1st coll. tr. stamped to 1942	1942	5½		
5⅛	7½	5⅛	14⅞	2½	15¼	¼	306	28,159	Lautaro Nitrate conv. 6s	1954	6	J. J.	32,000,000
96⅛	98½	95	99⅛	87	97¾	67	113	846	Montecatini Min. & Agric. deb 7s with warrants	1937	7	J. J.	8,188,000
49	49	46⅝	62	33¾	59	17	24	432	Ruhr chemical s. f. 6s	1948	6	A. O.	3,578,000
...	98½	97	99½	87	90	66	41	1,055	Solvay Am. Invest. 5% notes	1942	5	M. S.	15,000,000
...	69	66	76	50	66	39	18	253	Tenn. Corporation deb. 6s. "B"	1944	6	M. S.	3,308,000
59¼	63½	59	81	34¾	75	30	53	1,635	Vanadium Corp. conv. 5s	1941	5	A O.	5,000,000
NEW YORK CURB													
74	79	71¾	80½	49	76	55	459,000	3,500,000	Shawinigan W. & P. 4½s. "A"	1967	4½	A. O.	35,000,000
74¾	78½	72	80½	50	76	55	239,000	1,769,300	4½s., series "B"	1968	4½	M. N.	16,108,000
...	102½	101½	103½	101	103⅛	99	11,000	32,100	Westvaco Chlorine Prod. 5½s	1937	5½	M. S.	1,992,000

h 11 mos. ending Aug. 30 w 13 mos.; Before inventory adjustment; •New Low; †New High

The Trend of Prices

Indices of Business

	Latest Available Month	Previous Month	Year Ago
ƒ Automobile Production, Oct.	138,475	196,082	48,702
–†Brokers Loans, Nov. 29	$720	$698	$353
*Building Contracts, Oct.	$145,367	$122,549	$107,273
–*Car Loadings, Nov. 25	581	599	493
†Commercial Paper, Oct. 31	$129	$122	$113
–†Elec. output, kwh., Oct. 21	57.6	55.7	42.1
Payrolls, Sept.	74.3	73.3	60.3
Factory emp. U. S. (cor. seas. var.) Sept.	1,206	1,116	2,373
Failures, Dun & Bradstreet, Oct.			
*Merchandise Imports, Oct.	$151,000	$147,000	$105,499
*Merchandise Exports, Oct.	$194,000	$160,000	$153,090
Furnaces in Blast, % Nov. 1	27.4	31.2	17.2
*Steel Orders, Oct.	2,111	2,310	1,087

*000 omitted. †000,000. –Weeks, not months.

Moderate Improvement

Despite very serious controversy raging throughout the country over the monetary policy of the Administration and the uncertainty engendered by this situation in the minds of business men, retail trade forged ahead and the heavy industries showed signs of slight improvement. The downward swing of the past 3 months seemed to have been halted, temporarily at least, in November. Business indices, when comparison is made with a year ago, show up favorably. Retail trade was helped, of course, by the start of the seasonal and traditional Christmas rush, and by the slowly improving purchasing power of those returning to work. In most quarters, however, the rise of business in November, was disappointing. There is no gain-saying the fact that the country is marking time awaiting clarification of President Roosevelt's monetary program.

Steady loss in steel activity in the past few months stopped short in November and operations seemed to be pegged around 27%. As the month closed a slightly better percentage was announced. In the last 10 days of the month the Detroit area reported a much better rate of production as manufacturers prepared for '34 models. Electric output and carloadings show very little change, but they are still above the comparative figures for last year. Building statistics are showing up better largely, however, under the stimulus of the public works' program.

Trend in basic industries remains mixed. The glass industry continued to enjoy good business, largely a result of the anticipation of the end of the 18th Amendment. Paint and varnish producers reported November trade about equal to October. A slight improvement was reported in the shoe centers as a number of strikes ended. Despite a falling off in the last quarter 1933 world production will run about 20 to 25% above last year. Rayon plants continue to operate at fairly full schedules, but there appears to be a disinclination on the part of buyers to contract ahead, as shown by bookings for February. Textile processing and dyeing centers were more active due to the end of the protracted strikes and the resulting accumulation of orders.

Commodity prices fluctuated widely during November as the value of the dollar gyrated in terms of the gold franc. Most violent changes occurred early in the month coincident with the rise of the Pound to $5.52¼ in terms of the dollar. As the Pound turned easier prices fell off in the speculative commodity markets. Fisher's Commodity Index declined from 71.8 on Nov. 3 to 71.4 on Dec. 1; *N. Y. Journal of Commerce's* index declined from 72.0 on Oct. 28 to 70.3 on Dec. 2. The metal group particularly was weak. In the last few days of the month lead was reduced $5 a ton in an effort to stimulate buying. A similar reduction was made in copper. Tin and silver, on the other hand, reached new highs in November.

The *N. Y. Times* Index of Business Activity recorded advances in the last 3 weeks (ending Nov. 25). The index stood at 72.6 on Nov. 4 and at 74.8 on Nov. 25. On Nov. 26, 1932, it stood at 68.3. Following table gives the combined index and its component parts, which are adjusted for seasonal variations and, technically, for long-time trend:

	Weeks Ended Nov. 25 1933	Nov. 18 1933	Nov. 26 1932
Combined Index	**74.8**	**73.5**	**68.3**
Without cotton fdgs	74.8	73.9	....
Freight car loadings	60.1	61.0	57.7
Steel mill capacity	42.3	40.6	25.1
Electric power production	89.8	91.2	85.9
Automobile production	56.7	20.9	30.8
Lumber production	65.0	62.0	33.8
Cotton forwardings	80.5	73.2	86.7

November Chemical Tonnages

Activity in the chemical industry remained generally about on the same level in November as in the previous month. Shipments into textile centers were in better volume and represented the backlog caused by the serious labor troubles of the industry. In certain items where price advances have been made or are certain to be made for '34 consumers are building up large inventory stocks. This, of course, is directly opposite to the situation as it existed just a year ago when inventories were things to be avoided. Alkalies are in good demand from both the glass and rayon industries.

Interest has centered largely in the drive for '34 business. Practically all producers are using the recently suggested 6-month revision clause in writing up contracts. While hesitancy is being shown by some buyers a number have signed readily. Chemical producers have shown remarkable self-restraint and advances which have been made have been very modest indeed.

National Fertilizer Association Indices show very little change. In the 3 weeks between Nov. 4 and 25 metals advanced from 78.7 to 79.0; fats and oils from 46.5 to 47.0; chemicals and drugs from 87.0 to 88.2; fertilizer materials from 70.8 to 70.9. Mixed fertilizer was unchanged.

December is usually a month in which chemical shipments decline. Due to the desire of many consumers to enter the inventory period with large stocks shipments may not show the usual seasonal loss. Spot buying, however, has been light and it is thought in most quarters that further contraction is likely before the 1st of the year. Aside from the feeling of uneasiness over the monetary question and the general feeling that the convening of Congress early in January will afford a forum for further inflationary activity, the general feeling prevails that '34 will see still greater improvement in tonnages. It is certain, however, that the fight over monetary policies will provoke serious disagreements and result in hesitancy on the part of producers to contract ahead for any length of time. This problem overshadows all the others.

Publications

Tappi, 370 Lexington ave., N. Y. City, has issued Series XVI, No. 1, of the Technical Association Papers. Volume of 500 pages records technical development of pulp, paper, and related industries for 1932-33. Annual convention papers and proceedings of the Technical Association of the Pulp and Paper Industry are included. Price $5.

Animal and Vegetable Fats and Oils—production, consumption, imports, exports and stocks by quarters '28-'32. Superintendent of Documents—5c.

Helium, Information Circular 6745 (free) Information Division, Bureau of Mines, Washington. A 46-page history of helium with nearly 100 references by Dr. Andrew Stewart.

Anchor News for November (Anchor Cap & Closure Corp., Long Island City, N. Y.) shows a number of interesting closure problems—solved for well-known firms—when the product is oily, when the product is chemically active, when the product is volatile, are some of the problems illustrated profusely.

Prices Current

Heavy Chemicals, Coaltar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Naval Stores, Fatty Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Imported chemicals are so designated. Resale stocks when a market factor are quoted in addition to makers' prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1932 Average $1.64 - Jan. 1932 $1.54 - Nov. 1933 $1.40

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Acetaldehyde, drs 1c-1 wks...lb.	.18½	.21	.18½	.21	.18½	.21
Acetaldol, 50 gal dr.........lb.	.27	.31	.27	.31	.27	.31
Acetamide..................lb.	.95	1.35	.95	.35	.95	1.35
Acetanilid, tech, 150 lb bbl...lb.	....	.26	...	.26	.20	.26
Acetic Anhydride, 92-95%, 100 lb cbys...............lb.	.21	.25	.21	.25	.21	.25
Acetin, tech drums..........lb.	.30	.32	.30	.32	.30	.32
Acetone, tanks..............lb.	....	.09	.08	.10	...	.10
Acetone Oil, bbls NY......gal..	1.15	1.25	1.15	1.25	1.15	1.25
Acetyl Chloride, 100 lb cby...lb.	.55	.68	.55	.68	.55	.68
Acetylene Tetrachloride (see tetrachlorethane).............						
Acids						
Acid Abietic..................	....	.06	.06	.12	.12	.12
Acetic, 28% 400 lb bbls c-1 wks ....100 lb.	....	2.91	2.65	2.91	2.40	2.75
Glacial, bbl c-1 wk....100 lb.	....	10.02	9.14	10.02	8.35	9.14
Adipic......................	.72	.72	.72	.72	.72	.72
Anthranilic, refd, bbls........lb.	.85	.95	.85	.95	.85	.95
Technical, bbls............lb.	.65	.70	.65	.70	.65	.70
Battery, cbys...........100 lb.	1.60	2.25	1.60	2.25	1.60	2.25
Benzoic, tech, 100 lb bbls....lb.	.40	.45	.35	.45	.35	.45
Boric, powd, 250 lb. bbls. ....lb.	.0425	.05	.0425	.05	.0425	.07
Broenner's, bbls.. ....lb.	1.20	1.25	1.20	1.25	1.20	1.25
Butyric, 100% basis cbys....lb.	.80	.85	.80	.85	.80	.85
Camphoric.................lb.	....	5.25	...	5.25	.....	5.25
Chlorosulfonic, 1500 lb drums wks.................lb.	.04½	.05½	.04½	.05½	.04½	.05½
Chromic, 99¾%, drs.........lb.	....	.13½	.11½	.14¼	.11½	.14½
Chromotropic, 300 lb bbls....lb.	1.00	1.06	1.00	1.06	1.00	1.06
Citric, USP, crystals, 230 lb. bbls.................lb.	.29	.30	.29	.30	.29	.33½
Cleve's, 250 lb bbls.........lb.	.52	.54	.52	.54	.52	.54
Cresylic, 95%, dark drs NY.gal.	.44	.45	.38	.45	.40	.47
97-99%, pale drs NY.....gal.	....	.47	.40	.47	.42	.50
Formic, tech 90%, 140 lb. cby...................lb.	.11	.13	.10½	.13	.10½	.12
Furoic, tech., 100 lb. drums.lb.	....	.35	...	.35	.....	.....
Gallic, tech, bbls............lb.	.60	.70	.60	.70	.60	.70
USP, bbls................lb.	....	.74	...	.74	.....	.74
Gamma, 225 lb bbls wks.....lb	.77	.79	.75	.79	.75	.80
H, 225 lb bbls wks..........lb.	.65	.70	.60	.70	.60	.65
Hydriodic, USP, 10% soln cby lb.	.50	.51	.50	.51	.59	.67
Hydrobromic, 48%, coml, 155 lb cbys wks...........lb.	.45	.48	.45	.48	.45	.48
Hydrochloric, CP, see Acid Muriatic.................						
Hydrocyanic, cylinders wks .lb.	.80	.90	.80	.90	.80	.90
Hydrofluoric, 30%, 400 lb bbls wks..................lb.	....	.07	.06	.07	.....	.06
Hydrofluosilicic, 35%, 400 lb. bbls wks..............lb.	.11	.12	.11	.12	.11	.12
Hypophosphorous, 30%, USP, demijohns ....lb.	.75	.80	.75	.80	.75	.85
Lactic, 22%, dark, 500 lb bbls lb.	.04	.04½	.04	.04½	.04	.04½
44%, light, 500 lb bbls.....lb.	.11½	.12	.11½	.12	.11½	.12
Laurent's, 250 lb bbls.... ...lb.	.36	.37	.36	.37	.36	.42
Linoleic....................lb.	.16	.16	.16	.16	.16	.16
Maleic, cry. kegs............lb.	....	.35	...	...	...	...
Malic, powd, kegs...........lb.	.45	.60	.45	.60	.45	.60
Metanilic, 250 lb bbls........lb	.60	.65	.60	.65	.60	.65
Mixed Sulfuric - Nitric.........						
tanks wks..........N unit	.06½	.07½	.06½	.07½	.07	.07½
tanks wks..........S unit	.008	.01	.008	.01	.008	.01
Monochloroacetic, tech bbl...lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls..........lb.	1.50	1.60	1.50	1.60	1.55	1.70
Muriatic, 18 deg, 120 lb cbys c-1 wks............100 lb.	....	1.35	...	1.35	.....	1.35
tanks, wks...........100 lb.	....	1.00	...	1.00	.....	1.00
20 degrees, cbys wks...100 lb.	....	1.45	...	1.45	.....	1.45
N & W.............250 lb bbls	.85	.95	.85	.95	.85	.95
Naphthenic, drums ....lb.	.10	.11½	.10	.11½	.....	.....
Naphthionic, tech......250 lb.	.60	.65	.60	.65	.60	.65
Nitric, 36 deg, 135 lb cbys c-wks. ....100 lb.	....	5.00	...	5.00	.....	5.00
40 deg, 135 lb cbys, c-1 wks..............100 lb.	....	6.00	...	6.00	.....	6.00
Oxalic, 300 lb bbls wks NY....lb.	.11	.11½	.11	.11½	.11	.11½
Phosphoric 50%, U. S. P.....lb.	....	.14	...	.14	.....	.14
Syrupy, USP, 70 lb drs....lb.	....	.14	...	.14	.....	.14
Picramic, 300 lb bbls........lb.	.65	.70	.65	.70	.65	.70
Picric, kegs.................lb.	.30	.50	.30	.50	.30	.50
Pyrogallic, crystals............ ....lb.	1.40	1.45	1.40	1.45	1.45	1.60
Salicylic, tech, 125 lb bbl.....lb.	.33	.37	.33	.37	.33	.37
Sebacic, tech, drum..........lb.	.58	.58	.58	.58	.....	.....
Sulfanilic, 250 lb. bbls.......lb.	.15	.17	.15	.17	.14½	.16

†Anhydrous 5c higher. ‡From grain 5c higher. *Delivered metropolitan area, basic price 34c. §Higher price is refrigeration grade.

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Sulfuric, 66 deg, 180 lb cbys 1c-1 wks............100 lb.	1.60	1.95	1.60	1.95	1.60	1.95
tanks, wks, ton	....	15.00	....	15.00	.....	15.00
1500 lb dr wks......100 lb.	1.50	1.65	1.50	1.65	1.50	1.65
60°, 1500 lb dr wks....100 lb.	1.27½	1.42½	1.27½	1.42½	1.27½	1.42½
Oleum, 20%, 1500 lb. drs 1c-1 wks..................ton	....	18.50	....	18.50	.....	18.50
40%, 1c-1 wks net........ton	....	42.00	....	42.00	.....	42.00
Tannic, tech, 300 lb bbls...lb.	.23	.40	.23	.40	.23	.40
Tartaric, USP, gran. powd, 300 lb bbls..............lb.	....	.25	.20	.25	.20	.25½
Tobias, 250 lb bbls.........lb.	.75	.80	.75	.80	.75	.85
Trichloroacetic bottles.....lb.	2.00	2.75	2.00	2.75	.....	2.75
Kegs.....................lb.	...	1.75	....	1.75	.....	2.00
Tungstic, bbls..............lb.	1.40	1.70	1.40	1.70	1.40	1.70
Albumen, blood, 225 lb bbls...lb.	.35	.43	.35	.43	.35	.40
dark..............bbls., lb.	.10	.17	.10	.17	10	.20
Egg, edible ....lb.	....	.88	.74	.88	.75	.90
Technical, 200 lb cases...lb.	.62	.66	.62	.66	.62	.66
Vegetable, edible..........lb.	.65	.70	.60	.70	.60	.65
Technical.............lb.	.50	.55	.50	.55	.50	.55
Alcohol Butyl, Normal, 50 gal drs c-1 wks.............lb.	....	.10½	....	.10½	.123	.1595
Drums, 1-c-1 wks.......lb	....	.11	....	.11	.128	.1645
Tank cars wks..........lb.	....	.09½	....	.09½	.113	.143
Secondary tank ....lb.	....	.076	....	....	.....	....
drums carlots ....lb.	....	.086	....	....	.....	....
Amyl (from pentane) Tanks wks ....lb.	....	.143	.143	.176	.176	.203
Capryl, tech, drums.......lb.	....	.85	....	.85	.....	.85
Diacetone, tanks..........lb.	.15¾	.16¾	.15¾	.16¾	.....	.....
Ethyl, USP, 190 pf, 50 gal. bbls‡..............gal.	2.41½	2.58½	2.41½	2.65	2.55	2.65
No. 5. *188 pf, 50 gal. drs. drums extra†........gal.	....	.351*	....	.385*	.27	.396
No. S. D. 1, tanks......gal.	....	.304	....	.304	.....	.....
Furfuryl, tech., 500 lb. drs.lb	....	.40	.40	.45	.....	.....
Isobutyl, ref., gal. drs.....gal.	....	.75	....	.75	.....	.75
Isopropyl, ref, gal drs.....gal.	....	.50	.45	.50	.45	.65
Propyl Normal, 50 gal dr..gal.	....	.75	....	.75	.....	.75
Aldehyde Ammonia, 100 gal drlb.	.80	.82	.80	.82	.80	.82
Alpha-Naphthol, crude, 300 lb. bbls.................lb.	.65	.70	.65	.70	.57	.65
Alpha-Naphthylamine, 350 lb. bbls.................lb.	.32	.34	.32	.34	.32	.34
Alum Ammonia, lump, 400 lb bbls, 1-c-1 wks......100 lb.	3.00	3.25	3.00	3.25	3.00	3.25
Chrome, 500 lb casks, wks ....100 lb.	....	6.50	4.50	6.50	4.50	5.25
Potash, lump, 400 lb casks wks...............100 lb.	3.00	3.50	3.00	3.50	3.00	3.50
Soda, ground, 400 lb bbls wks...............100 lb.	3.50	3.75	3.50	3.75	3.50	3.75
Aluminum Metal, c-1 NY.100 lb.	22.90	24.30	22.00	24.30	22.90	24.30
Chloride Anhydrous ......lb.	.04	.08	.04	.09	.05	.09
Hydrate, 96%, light, 90 lb. bbls.................lb.	.15	.16½	.15	.16½	.15	.17
Palmitate, bbls...........lb	.19	.20	....	....	.....	.....
Resinate, pp., bbls........lb.	.12½	.14	....	....	.....	.....
Stearate, 100 lb bbls.......lb.	.17	.18	.12½	.18	.15	.21
Sulfate, Iron, free, bags c-1 wks.............100 lb.	1.90	1.95	1.90	1.95	1.90	1.95
Coml, bags c-1 wks .100 lb.	1.35	1.50	1.25	1.50	1.25	1.30
Aminoazobenzene, 110 lb kegs lb.	....	1.15	....	1.15	.....	1.15
Ammonia						
Ammonia anhydrous Com. tanks	.04½	.05½§	.04½	.05½	.05	.05½
Ammonia, anhyd. 100 lb cyl...lb.	.15½	.15½	.15½	.15½	.15½	.15½
Water, 26°, 800 lb dr del...lb.	.02½	.03	.02½	.03	.02½	.03
Ammonia, aqua 26° tanks.... NH cont..................	....	.05	.....	.05	.....	.....
Ammonium Acetate ....lb.	.26	.33	.26	.33	.26	.39
Bicarbonate, bbls., f.o.b. plant ....100 lb.	....	5.15	....	5.15	.....	5.15
Bifluoride, 300 lb bbls.....lb.	.15¼	.17	.15¼	.17	.14½	.22
Carbonate, tech, 500 lb cs .lb.	.08	.12	.08	.12	.08	.12
Chloride, white, 100 lb. bbls wks ....100 lb.	5.00	5.25	4.45	5.25	4.45	5.15
Gray, 250 lb bbls wks...lb.	5.25	5.75	5.25	5.75	5.25	5.75
Lump, 500 lb cks spot...lb.	10	11	.10	.11	.10½	.11½
Lactate, 500 lb bbls.......lb.	.15	.16	.15	.16	.15	.16
Linoleate.................lb.	....	.11	....	.11	.11	.15
Nitrate, tech, casks........lb.	.03¾	.05	.03¾	.10	.06	.10
Oleate, drs................lb.	....	.10	....	.10	.....	.10
Persulfate, 112 lb kegs.....lb.	.20	.22½	.20	.22½	.20	.27½
Phosphate, tech, powd, 325 lb. bbls.................lb.	.08½	.11½	.08½	.11½	.08½	.12
Sulfate, bulk c-1.......100 lb.	....	1.25	1.00	1.25	.90	1.40
Sulfocyanide, kegs........lb.	.36	.48	.36	.48	.36	.48
Amyl Acetate, (from pentane) Tanks del.............lb	....	.13½	...	13½	.157	.17½

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Tech., drs del. . . . . .lb.	.142	.149	.138	.149	.17½	.18
Amyl Alcohol, see Fusel Oil.						
Aniline Oil, 960 lb drs & tks. .lb.	.13½	.14¼	.14½	.16	.14½	.16
Annatto. fine. . . . . .lb.	.34	.37	.34	.37	.34	.37
Anthracene, 80%. . . . . .lb.	....	.75	....	....	.....	.....
40%. .lb.	....	.18	....	....	.....	.....
Anthraquinone, sublimed, 125 lb. bbls. . . . . .lb.	....	.45	...	.45	.45	.55
Antimony, metal slabs, ton lots . . . . .lb.	....	.06¾	.05⅝	.07½	.05	.06½
Needle, powd, bbls. . . . . . . .lb.	.08	.09	.07	.09	.08½	.09
Chloride, soln (butter of) cbys. . . . . .lb.	.13	.17	.13	.17	.13	.17
Oxide, 500 lb bbls. . . . . .lb.	.08½	.11	.07½	.11	.07½	.08⅜
Salt, 63% to 65%, tins. . . .lb.	.22	.24	.20	.24	.20	.24
Sulfuret, golden, bbls . . . . .lb.	.16	.20	.16	.20	.16	.20
Vermillion, bbls. . . . . .lb.	.38	.42	.38	.42	.38	.42
Archil, conc, 600 lb bbls. . . . .lb.	.20	.21	.20	.21	.17	.21
Double, 600 lb bbls. . . . . . . .lb	.16	.17	.16	.17	.16	.17
Triple, 600 lb bbls. . . . . . . .lb.	.16	.17	.16	.17	.16	.17
Argols, 80%, casks. . . . . .lb.	.14	.15	.12	.15	.12½	.13
Crude, 30%, casks. . . . . . . .lb.	.07	.08	.06¾	.09	.07	.07½
Aroclors, wks. . . . . .lb.	.18	.30	.18	.30	.18	.40
Arrowroot, bbl. . . . . .lb.	.08¼	.08¾	....	....	.....	.....
Arsenic, Red. 224 lb kegs, cs. .lb.	.14	.14¾	.09⅜	.14¾	.09⅜	.10
White, 112 lb kegs. . . . . .lb.	.04	.05	.04	.05	.04	.05
Asbestine, c-1 wks. . . . . .ton	13.00	15.00	13.00	15.00	.....	15.00
Barium						
Barium Carbonate, precip, 200 lb. bags wks. . . . . .ton	56.50	61.00	56.50	61.00	47.00	57.00
Nat. (witherite) 90% gr. carlots wks bags. . . . . .ton	.....	45.00	.....	.....	.....	.....
Chlorate, 112 lb kegs NY. .lb.	.15	.16	.13¾	.16	.13¾	.15
Chloride, 600 lb bbl wks. . .ton	72.00	74.00	61.50	74.00	63.00	69.00
Dioxide, 88%, 690 lb drs. . .lb.	.11	.13	.11	.13	.11	.13
Hydrate, 500 lb bbls. . . . . . .lb.	.04¾	.05	.04½	.05	.04¾	.05½
Nitrate, 700 lb casks. . . . . .lb.	.....	.07½	...	.07½	.07	.08
Barytes, Floated, 350 lb bbls wks. . . . . .ton	22.50	30.50	22.20	30.50	22.00	24.00
Bauxite, bulk, mines. . . . . . . .ton	5.00	6.00	5.00	6.00	5.00	6.00
Bayberry, bags. . . . . .lb.	.15	.16	.14½	.17	.....	.....
Beeswax, Yellow, crude bags. .lb.	.18	.19	.13	.20	.14½	.24
Refined, cases. . . . . .lb.	.22	.24	.18	.26	.20	.28
White, cases. . . . . .lb.	.32	.35	.30	.35	.30	.36
Benzaldehyde, technical, 945 lb. drums wks. . . . . .lb.	.60	.65	.60	.65	.60	.65
Benzene, 90%, Industrial, 8000 gal tanks wks. . . . . .gal	.....	.22	.20	.22	.....	.20
Ind. Pure, tanks works. . . .gal	.....	.22	.20	.22	.....	.20
Benzidine Base, dry, 250 lb. bbls. . . . . .lb.	.67	.69	.65	.67	.65	.67
Benzoyl, Chloride, 500 lb drs.lb.	.40	.45	.40	.45	.40	.47
Benzyl Chloride, tech drs. . . .lb.	.....	30	...	.30	.....	.30
Beta-Naphthol, 250 lb bbl wk .lb.	.....	.24	...	.24	.....	.22
Naphthylamine, sublimed, 200 lb bbls. . . . . .lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls . . . . .lb.	.53	.58	.53	.58	.53	.58
Bismuth, metal.	....	1.30	85	1.30	.....	.....
Bismuth Subnitrate	....	1.40	.95	1.40	.....	.....
Blackstrap, cane, (see Molasses, Blackstrap)						
Blanc Fixe, 400 lb bbls wks. .ton	42.50‡	70.00	42.50	75.00	.....	.....
Bleaching Powder, 800 lb drs c-1 wks contract. . . .100 lb.	.....	1.90	1.75	1.90	1.75	2.00
Blood, Dried, fob, NY. . . . .Unit	.....	2.75	1.55	2.75	1.20	1.90
Chicago, high grade. . . . .Unit	.....	2.50	....	....	.....	.....
S. American shipt. . . . . . .Unit	.....	3.00	1.90	3.00	2.00	2.25
Blues, Bronze Chinese Milori Prussian Soluble. . . . . . . .lb.	.....	.35	...	.35	.....	.35
Bone, raw, Chicago. . . . . .ton	26.00	28.00	19.00	28.00	20.00	22.00
Bone Ash, 10C lb kegs. . . . . . .lb.	.06	.07	.06	.07	.06	.07
Black, 200 lb bbls. . . . . .lb.	.05½	.08½	.05½	.08¼	.05½	.08¼
Meal, 3% & 50%, Imp. . . .ton	.....	27.50	18.00	27.50	20.00	23.00
Borax, bags . . . . .lb.	.018	.02	.018	.02	.018	.03½
Bordeaux, Mixture, 16% pwd.lb.	.08½	.10½	.11½	.10½	.11½	.13
Paste, bbls. . . . . .lb.	.08½	.13	.10½	.13	.11½	.13
Brazilwood, sticks, shpmt. . . . .lb.	26.00	28.00	26.00	28.00	26.00	28.00
Bromine, cases. . . . . .lb.	.36	.43	.36	.43	.36	.43
Bronze, Aluminum, powd blk. .lb.	.50	.75	.50	.75	.60	1.20
Gold bulk. . . . . .lb.	.40	.55	.40	.55	.55	1.25
Butanes, com 16.32° group 3 tanks. . . . . .lb.	.02¾	.04	.02¾	.04	.....	.....
Butyl, Acetate, normal drs. . .lb.	.....	.11	.11	.139	.134	.166
Tank, wks. . . . . .lb.	.....	.10	.10	.124	.124	.143
Secondary tanks, wks. . . . . .lb.	....	.08	....	....	.....	.....
Aldehyde, 50 gal drs wks. . .lb.	.35	.36	.31½	.36	.31½	.36
Carbitol see Diethylene Glycol Mono (Butyl Ether)		.....	....	....	.....	.....
Cellosolve (see Ethylene glycol mono butyl ether).						
Furoate. tech.. 50 gal. dr. . .lb.	.....	.60	.50	.60	.....	.50
Lactate, drums . . . . .lb.	....	.29	....	....	.....	.....
Propionate, drs. . . . . .lb.	.20	.22	.20	.22	.20	.25
Stearate, 50 gal drs. . . . . . .lb.	.25	.25½	.25	.25½	.25	.25½
Tartrate, drs . . . . .lb.	.55	.60	.55	.60	.55	.60
Cadmium, Sulfide, boxes. . . . .lb.	.65	.75	.65	.75	.65	.90
Calcium, Acetate, 150 lb bags c-1. . . . . .100 lb.	.....	3.00	2.50	3.00	2.00	2.50
Arsenate, 100 lb bbls c-1 wks . . . . .lb.	.....	.07	.05½	.07	.05½	.06
Carbide, drs. . . . . .lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bags c-1. . . . . .lb.	1.00	1.00	1.00	1.00	1.00	1.00
Chloride, Flake, 375 lb drs c-1 wks. . . . . .ton	.....	19.50	19 50	21.00	.....	21.00
Solid, 650 lb drs c-1 fob wks . . . . .ton	.....	17.50	17.50	18.00	.....	18.00
Ferrocyanide, 350 lb. bbls. f.o.b. wks. . . . . .lb.	.....	.17	.17	.17	.....	.....

†F. O. B. destination, 1931 prices are works prices.
‡Lowest price is for pulp; highest for high-grade precipitate.

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Calcium Furoate, tech, 100 lb. drums...lb.	....	.30	....	.30	....	.30
Nitrate, 100 lb bags...ton	....	26.50	24.00	26.50	34.00	35.00
Palmitate, bbls...lb.	.19	.20	.16	.19	....	....
Peroxide, 100 lb drs...lb.	....	1.25	....	1.25	....	1.25
Phosphate, tech, 450 lb bbls.lb.	.07½	.08	.07½	.08	.07½	.08¾
Resinate. precip., bbls...lb.	.13	.14	....	....	....	....
Stearate, 100 lb. bbls...lb.	.17	.18	.12½	.18	.16	.18
Camphor, slabs...lb.	.58	.59	.35½	.59	....	....
Powder...lb.	.58	.59	.38	.59	....	....
Camwood, Bark, ground bbls.lb.	.16	.18	.16	.18	.16	.18
Candelilla Wax, bags...lb.	.09½	.10	.09	.11	.10	.14
Carbitol, (See Diethylene Glycol Mono Ethyl Ether)...		....	....	...	....	....
Carbon, Decolorizing, drums c-1...lb.	.08	.15	.08	.15	.08	.15
Black, 100-300 lb cases 1c-1 NY...lb.	.06½	.12	.06	.12	.06	.12
Bisulfide, 500 lb drs 1c-1 NY...lb.	.05½	.06	.05½	.06	.05½	06
Dioxide, Liq. 20-25 lb cyl..lb.	..	.06	....	.06	....	.06
Tetrachloride, 1400 lb drs delivered...lb.	.05¼	.06	.05¼	.07	.06¼	.07
Carnauba Wax, Flor, bags...lb.	.24	Nom.	.23	.31	.23	.28
No. 1 Yellow, bags...lb.	.32	.35	.20	.35	.21	.24
No. 2 N Country, bags...lb.	.19	.20	.14	.20	.13	.16
No. 3 N. C....lb.	.16	.17	.11½	.17	.11	.13
No. 3 Chalky...lb.	.16	.17	.12	.17	.11	.13
Casein, Standard, Domestic.... ground...lb	.12½	.13	.06½	.15	.04¾	.07½
80-100 mesh carlots, bags..lb.	.13½	.14	....	....	....	....
Cellosolve (see Ethylene glycol mono ethyl ether)...						
Acetate (see Ethylene glycol mono ethyl ether acetate)..						
Celluloid, Scraps, Ivory cs...lb.	.13	.14	.13	.15	.13	.15
Shell, cases...lb.	.18	.20	.18	.20	.18	.20
Transparent, cases...lb.	....	.16	....	.16	....	.15
Cellulose, Acetate, 50 lb kegs.lb.	.80	.90	.80	.90	.80	.90
Chalk, dropped, 175 lb bbls..lb.	.03	.03¾	.03	.03¾	.03	.03¾
Precip, heavy, 560 lb cks...lb.	.02	.03½	.02	.03½	.02	.03½
Light, 250 lb casks...lb.	.02½	.03½	.02½	.03½	.02½	.03½
Charcoal, Hardwood, lump, bulk wks...bu.	.18	.19	.18	.19	.18	.19
Willow, powd, 100 lb bbl. wks...lb.	.06	.06¼	.06	.06¼	.06	.06¼
Wood, powd, 100 lb bbls...lb.	.04	.05	.04	.05	.04	.05
Chestnut, clarified bbls wks...lb.	.01¼	.02	.01¼	.02	.01⅝	.02
25% tks wks...lb.	....	.01½	.012	.01½	.01¾	.02½
Powd, 60%, 100 lb bgs wks.lb.	....	.04¾	....	.04¾	....	.04¾
Powd, decolorized bgs wks..lb.	.04⅞	.05	.04⅞	.05	.04⅞	.06
China Clay, lump, blk mines..ton	8.00	9.00	8.00	9.00	8.00	9.00
Powdered, bbls...lb.	.01	.02	.01	.02	.01	.02
Pulverized, bbls wks...ton	10.00	12.00	10.00	12.00	10.00	12.00
Imported, lump, bulk...ton	15.00	25.00	15.00	25.00	15.00	25.00
Chlorine, cyls 1c-1 wks contract...lb.	.07	.08½	.07	.08½	.07	.08½
cyls, cl., contract...lb.	....	.05½†	....	.05½	....	.05½
Liq tank or multi-car lot cyls wks contract...100 lb.	....	1.85	1.75	1.85	1.55	1.75
Chlorobenzene, Mono, 100 lb. drs 1c-1 wks...lb.	.06	.07½	.06	.07½	.06	.10½
Chloroform, tech, 1000 lb drs..lb.	....	.20	.15	.20	.15	.16
USP, tins...lb.	....	.30	....	....	....	....
Chloropicrin, comml cyls...lb.	.90	1.25	.90	1.35	1.00	1.35
Chrome, Green, CP...lb.	.23	.29	.23	.29	.23	.29
Commercial...lb.	.06¼	.10	.06¼	.10	.06¼	.11
Yellow...lb.	.14	.15	.14	.15	.14	.18
Chromium, Acetate, 8% Chrome bbls...lb.	.05	.05¾	.04¾	.05¾	.04¾	.05¾
20° soln, 400 lb bbls...lb.	....	.05½	....	.05½	....	.05½
Fluoride, powd, 400 lb bbl..lb.	.27	.28	.27	.28	.27	.28
Oxide, green, bbls...lb.	.28	.33	.28	.33	.28	.35½
Coal tar, bbls...bbl.	8.50	9.00	.50	9.00	10.00	10.50
Cobalt Acetate, bbls...lb.	.75	.80	....	....	....	....
Carbonate tech., bbls...lb.	1.34	1.40	....	....	....	....
Hydrate, bbls...lb.	1.66	1.76	....	....	....	....
Linoleate, paste, bbls...lb.	.39	.40	....	....	....	....
Resinate, fused, bbls...lb.	....	.12½	....	....	....	....
Precipitated, bbls...lb.	.41	.42	.41	.42	....	....
Cobalt Oxide. black. bags...lb.	1.15	1.25	1.15	1.25	1.15	1.45
Cochineal, gray or black bag..lb.	.36	.42	.36	.42	.38	.57
Teneriffe silver, bags...lb.	.37	.43	.37	.43	.39	.57
Copper, metal, electrol...100 lb.	....	8.00	5.00	9.00	5.05	7.25
Carbonate, 400 lb bbls...lb.	....	.08	.07	.08	.07	.08
52-54% bbls...lb.	....	.15½	.15¾	.17¼	....	....
Chloride, 250 lb bbls...lb.	.17	.18	.17	.18	.17	.25
Cyanide, 100 lb drs...lb.	.39	.40	.39	.40	.39	.40
Oleate, precip., bbls...lb.	....	.20	....	....	....	....
Oxide, red, 100 lb bbls...lb.	.14¾	.15	.14¾	.15	.15	.16
Resinate, precip., bbls...lb.	.18	.19	....	....	....	....
Stearate, precip., bbls...lb.	.35	.40	....	....	....	....
Sub-acetate verdigris, 400 lb bbls...lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls c-1 wks...100 lb.	....	3.75	3.00	3.75	2.75	3.10
Copperas, crys and sugar bulk c-1 wks bags...ton	14.00	14.50	14.00	14.50	14.00	14.50
Corn Syrup, 42 deg., bbls.100 lb.	2.84	3.04	2.61	3.04	....	....
43 deg., bbls...100 lb.	2.89	3.09	2.66	3.09	....	....
Cotton, Soluble, wet, 100 lb bbls...lb.	.40	.42	.40	.42	.40	.42
Cottonseed, S. E. bulk c-1...ton		*(See Oils and Fats News Section)*				
7% Amm., bags mills...ton	13.25	38.00	13.25	38.00	13.25	38.00
Cream Tartar, USP, 300 lb. bbls...lb.	.17½	.17¾	.14½	.17¾	.15½	.20½
Creosote, USP, 42 lb cbys...lb.	.45	.47	.40	.47	.40	.42
Oil, Grade 1 tanks...gal.	.11	.12	.11	.12	11	12½
Grade 2...gal.	.10	.12	.10	.12	.10	.11½
Grade 3...gal.	.09	.12	.09	.12	.09	.11½
Cresol, USP. drums...lb.	.10½	.11	.10½	.11	.10½	.11

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Crotonaldehyde, 50 gal dr....lb.	.32	.36	.32	.36	.32	.36
Cudbear, English............lb.	.19	.25	.16	.25	.16	.17
Cutch, Rangoon, 100 lb bales.lb.	.....	.02¾	.02½	.03	.08¾	.12
Borneo, Solid, 100 lb bale...lb.	.....	.04½	.02½	.04½	.03	.07
Cyanamide, bags c-1 frt allowed Ammonia unit..................		1.07½	.97½	1.07½		97½
Dextrin, corn, 140 lb bags.100 lb.	.....	3.62	2.89	3.84	2.99	3.67
British Gum, bags .....100 lb.	.....	3.87	3.89	3.92	.....	.....
White, 140 lb bags.....100 lb	.....	3.57	2.94	3.79	2.94	3.37
Potato Yellow, 220 lb bgs..lb.	.07¾	.08¾	.07¾	.09	.08	.09
White, 220 lb bags 1c-1....lb.	.08	.09	.08	.09	.08	.09
Tapioca, 200 lb bags 1c-1...lb.	.06¾	.07¾	.06¾	.08	.07	.08¾
Diamylether, wks., drums....lb.	.....	.60	....	....	.....	.....
Diamylphthalate, drs wks...gal.	.....	.20½	....	....	.....	.....
Dianisidine, barrels..........lb.	2.35	2.70	2.35	2.70	2.35	2.70
Dibutylphthalate, wks.......lb.	.20½	.21	.20½	.22	.218	.23½
Dibutyltartrate, 50 gal drs...lb.	.29½	.31½	.29½	.21	.29½	.31½
Dichlorethylene, drums.....gal.	.29	....	....	....	.....	.....
Dichloroethylether, 50 gal drs lb.	.....	.16	....	.16	.....	.16
Dichloromethane, drs wks....lb.	....	.15	....	....	.....	.....
Diethylamine, 400 lb drs.....lb.	2.75	3.00	2.75	3.00	2.75	3.00
Diethylcarbonate, com. drs..gal.	.....	.31¾	....	....	.....	.....
Diethylaniline, 850 lb drs....lb.	.52	.55	.52	.55	.55	.60
Diethyleneglycol, drs........lb.	.14	.16	.14	.16	.14	.16
Mono ethyl ether, drs...lb.	.15	.16	.15	.16	.15	.16
Mono butyl ether, drs...lb.	.....	.26	....	.26	.24	.30
Diethylene oxide, 50 gal drs..lb.	.26	.27	.26	.27	.....	.....
Diethylorthotoluidin, drs.....lb.	.64	.67	.64	.67	.64	.67
Diethyl phthalate, 1000 lb. drums..................lb.	.....	.20	.20	.26	.23	.26
Diethylsulfate, technical, 50 gal drums..................lb.	...	...	....	....	.30	.35
Digtycol Oleate, bbls........lb.	.....	.16	....	....	.....	.....
Dimethylamine, 400 lb drs, pure 25 & 40% sol. 100% basis.lb.	.....	1.20	....	....	.....	....
Dimethylaniline, 340 lb drs...lb.	.26	.28	.25	.28	.25	.27
Dimethyl phthalate drs......lb.	.....	.24½	....	....	.....	.....
Dimethylsulfate, 100 lb drs...lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls...lb.	.....	.18	....	.18	.15	.16
Dintrochlorobenzene, 400 lb bbls...................lb.	.13	.15	.13	.15	.13	.15
Dinitronaphthalene, 350 lb bbls ....lb.	.34	.37	.34	.37	.34	.37
Dinitrophenol, 350 lb bbls....lb.	.23	.24	.23	.24	.23	.24
Dinitrotoluene, 300 lb bbls....lb.	.15	.16	.15	.17	.16	.17
Dioxan (See Diethylene Oxide).......		.....	....	....	.....	.....
Diphenyl..................lb.	.15	.25	.15	.40	.20	.40
Diphenylamine.............lb.	.31	.34	.31	.34	.34	.37
Diphenylguanidine, 100 lb bbl lb.	.33	.35	.30	.35	.30	.35
Dip Oil, 25%, drums........lb.	.23	.25	.23	.25	.26	.30
Divi Divi pods, bgs shipmt..ton	34.00	36.00	26.00	36.00	26.00	30.00
Extract...................lb.	.05	.05½	.05	.05½	.05	.05½
Egg Yolk, 200 lb cases ......lb.	.42	.43	.40	.43	.40	.52
Epsom Salt, tech, 300 lb bbls c-1 NY... ....100 lb.	.....	2.20	....	2.20	1.70	1.90
Ether, USP anaesthesia 55 lb. drs. .. ..lb.	.....	.24	.22	.24	.22	.23
(Conc).....................lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal. drums ...lb.	.07‡x	.08	.07	.08	.....	.....
Synthetic, wks, drums.....lb.	.08	.09	....	....	.....	.....
Ethyl Acetate, 85% Ester tanks..................lb.	.07½	.08	.07½	.09	.08½	.09
drums..................lb.	.08½	.09	.08½	.10	.09½	.10
Anhydrous, tanks.........lb.	.09	.10	.09	.10	.....	.10
drums..................lb.	.10	.10¼	.10	.10¼	.....	.10¼
Acetoacetate, 50 gal drs....lb.	.65	.68	.65	.68	.65	.68
Benzylaniline, 300 lb drs...lb.	.88	.90	.88	.90	.88	.90
Bromide, tech, drums......lb.	.50	.55	.50	.55	.50	.55
Carbonate, 90%, 50 gal drs gal.	1.85	1.90	1.85	1.90	1.85	1.90
Chloride, 200 lb drums.....lb	.22	.24	.22	.24	.....	.22
Chlorocarbonate, cbys.....lb.	.....	.30	....	.30	....	.30
Ether, Absolute, 50 gal drs.lb.	.50	.52	.50	.52	.50	.52
Furoate, 1 lb tins.........lb.	.....	1.00	1.00	5.00	.....	5.00
Lactate, drums works .. .lb.	.25	.29	.25	.29	.25	.29
Methyl Ketone, 50 gal drs..lb.	.....	.12½	....	.12½	.....	.30
Oxalate, drums works......lb.	.37½	.55	.37½	.55	.37½	.55
Oxybutyrate, 50 gal drs wks lb.	.30	.30½	.30	.30½	.....	.30½
Ethylene Dibromide, 60 lb dr..lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys. chloro, cont.............lb.	75	.85	.75	.85	.7	.85
Dichloride, 50 gal drums....lb.	.05	.06	.05	.09	.0595	.07
Glycol, 50 gal drs wks.....lb.	.26	.28	.25	.28	.25	.28
Mono Butyl Ether drs wks......		.20	....	.20	.20	.24
Mono Ethyl Ether drs wks	.15	.17	.15	.17	.15	.20
Mono Ethyl Ether Acetate dr. wks..................	.16½	.18	.16½	.18	.16½	.23
Mono Methyl Ether, drs..lb.	.21	.23	.21	.23	.21	.23
Stearate..................	.18	.18	.18	.18	.18	.18
Oxide, cyl................lb.	.....	.75	....	.75	.75	2.00
Ethylidenaniline............lb.	.45	.47½	.45	.47½	.45	.47½
Feldspar, bulk pottery .....ton	15.50	16.50	14.00	16.50	15.00	20.00
Powdered, bulk works....ton	13.50	14.50	13.50	14.50	15.00	21.00
Ferric Chloride, tech, crystal 475 lb bbls.............lb.	.05	.07½	.04½	07½	.04½	.07½
Fish Scrap, dried, wks......unit	.....	2.50*	1.85	2.75*	1.60	3.00
Acid, Bulk 7 & 3½% delivered Norfolk & Balt. basis...unit	.....	2.50†	1.85	2.50†	1.40	2.40
Fluorspar, 98% bags..........	28.00	35.50	28.00	35.50	28.00	46.00

*& 10; †& 50 xTanks 2c lower.

Formaldehyde

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Formaldehyde, aniline, 100 lb......		.....	....	....	.....	.....
drums..................lb.	.37½	.42	.37½	.42	.37½	.42
USP, 400 lb bbls wks......lb.	.06	.07	.06	.07	.06	.07¾
Fossil Flour................lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, bulk, mines...ton	15.00	20.00	15.00	20.00	15.00	20.00
Imp. powd c-1 bags.......ton	24.00	30.00	24.00	30.00	24.00	30.00
Furfural (tech.) drums wks,. .lb.	.10§	.15	.10	.15	.....	.10
Furfuramide (tech) 100 lb dr..lb.	.....	.30	....	.30	.....	.30
Furfuryl Acetate, 1 lb tins....lb.	.....	5.00	....	5.00	.....	5.00
Fusel Oil, 10% impurities....lb.	.16	.18	.14½	.18	.....	.....

‡Higher price, refined. §Tanks, 1c lower

Current

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Fustic, chips................lb.	.04	.05	.04	.05	.04	.05
Crystals, 100 lb boxes.....lb.	.20	.23	.18	.23	.18	.20
Liquid 50°, 600 lb bbls.....lb.	.08	.10	.07	.10	.07	.08
Solid, 50 lb boxes.........lb.	.16	.18	.14	.18	.14	.16
Sticks....................ton	25.00	26.00	25.00	26.00	25.00	26.00
G Salt paste, 360 lb bbls.....lb.	.42	.43	.42	.43	.42	50
Gall Extract................lb.	.18	.20	.18	.20	.18	.20
Gambier, common 200 lb cs..lb.	.04	.05½	.03	.07	.06½	.07
Singapore cubes, 150 lb bg..lb.	.06	.07	.05¼	.08	.07¾	.09
Gelatin, tech, 100 lb cases.....lb.	.45	.50	.45	.50	.45	.50
Glauber's Salt, tech, c-1 wks. ....100 lb.	1.10	1.30	1.00	1.70	1.00	1.70
Glucose (grape sugar) dry 70-80° bags c-1 NY........100 lb.	3.24	3.34	3.24	3.34	3.24	3.34
Tanner's Special, 100 lb bags ....100 lb.	.....	2.33	....	2.33	2.36	2.75
Glue, medium white, bbls....lb.	.19	.23	.12	.23	.15½	.20
Pure white, bbls...........lb.	.23	.28	.18	.28	.18	.27
Glycerin, CP, 550 lb drs......lb.	.....	.11	.10¼	.11	.09¾	.11½
Dynamite, 100 lb drs......lb.	.....	.10¼	.07½	.10¼	.07½	.09¾
Saponification, tanks......lb.	.07½	.08	.05	.08	.04½	.06¼
Soap Lye, tanks. ....lb.	.....	.06½	.04	.06½	.03¾	.05
Glyceryl Stearate, bbls......lb.	.....	.18	.17	.18	.....	.17
Graphite,						
Crystalline, 500 lb. bbls...lb.	.0	.0	.04	.05	.04	.05
Flake, 500 lb bbls.........lb.	.08	.16	.08	.16	.08	.16
Amorphous bbls............lb.	.03	.0	.03	.04	.03	.04
Gums						
Gum Accroides, Red, coarse and fine 140-150 lb bags.......lb.	.03¾	.04½	.03¾	.04½	.03¾	.04½
Powd, 150 lb bags.........lb.	.06	.06½	.06	.06½	.06	.06½
Yellow. 150-200 lb bags....lb.	.18	.20	.18	.20	.18	.20
Aloes, Barbadoes ....lb.	.85	.90	.85	.90	.....	.....
Animi (Zanzibar) bean & pea 250 lb cases............lb.	.35	.40	.35	.40	.35	.40
Glassy, 250 lb cases.......lb.	.50	.55	.50	.55	.50	.55
Arabic, amber sorts.........lb	.07¾	.08	.05¾	.08	.....	.....
Asphaltum, Barbadoes (Manjak) 200 lb bags.............lb.	.03	.06	.03	.05	.04	.06
Egyptian, 200 lb cases.......lb.	.13	.15	.13	.15	.13	.15
Ester, light.................lb.	.....	.06	....	....	.....	.....
Dark.....................lb.	.....	.05¾	....	....	.....	.....
Gamboge, pipe, cases........lb.	.60	.65	.42	.65	.....	.....
Powdered, bbls............lb.	.65	.70	.50	.70	.....	.....
Gilsonite Selects, 200 lb bags ....ton	30.50	32.90	30.50	32.90	30.50	32.90
Damar Batavia standard 136, lb. cases.................lb.	.13	.13½	.08½	.15½	.08½	.09
Batavia Dust, 160 lb bags.....lb.	.06¼	.07	.04	.07½	.04	.05½
E Seeds, 136 lb cases.......lb.	.08	.09	.05½	.09½	.05½	.06½
F Splinters, 136 lb cases and bags.................lb.	.05½	.06	.05½	.06	.05½	.06
Singapore, No. 1, 224 lb cases .lb.	.17¼	.18	.09½	.18	.10½	11
No. 2, 224 lb cases........lb.	.10½	.11	.07	.11½	.06	.07½
No. 3, 180 lb bags.........lb.	.06½	.07	.04½	.07½	.04½	.05
Benzoin Sumatra, U. S. P. 120 lb. cases.................lb.	.20	.20½	.17	.23	.18	.22
Copal Congo, 112 lb bags, clean opaque...............lb.	.27½	.28	.16½	.28	.16½	.17
Dark, amber.............lb.	.09¾	.10½	.06	.10½	.06	.07
Light, amber.............lb.	.15	.19	.08	.19	.08	.09
Water, white.............lb.	.47	.48	.37	.48	.37	.45
Kino, tins..................lb.	.75	.80	....	....	.....	.....
Mastic.....................lb.	.37¼	.40	.26⅞	.40	.26⅞	.40
Manila 180-190 lb baskets						
Loba A...................lb.	.13¾	.14½	.09	.13½	.09	.11
Loba B...................lb.	.12¾	.13½	.08	.13	.08	.08½
Loba C...................lb.	.11	.11½	.07	.12	.07	.08
M A Sorts...............lb.	.06½	.07	.05	.07	.04¾	.05
D B B Chips.............lb.	.08½	.09	.05¾	.09½	.05	.06½
East Indies chips, 180 lb bags lb.	.04¼	.05	.04	.07	.04½	.05½
Pale bold, 224 lb cs......lb.	.16	.17	.05½	.17	.06	.08
Pale nubs, 180 lb bags...lb.	.11	.13	.05	.13	.03½	.05
Pontianak, 224 lb cases........						
Bold gen No. 1.........lb.	.17½	.18½	.14	.18½	.14	.16
Gen. chips spot.........lb.	.07	.08	.05	.08	.05	.08
Elemi, No. 1, 80-85 lb cs.....lb.	.11	.11½	.09	.12½	.09	.09½
No. 2, 80-85 lb cases.....lb.	.10¾	.11¼	.08½	.12	.08½	.09
No. 3, 80-85 lb cases.....lb.	.08	.08½	.08	.08½	.08	.08½
Ghatti, sol. bags...........lb.	.09	.09½	.06	.09½	.....	.....
Karaya, pow. bbls xxx.......lb.	.23	.25	....	....	.....	.....
xx.......................lb.	.15	.16	....	....	.....	.....
No. 1....................lb.	.10	.11	....	....	.....	.....
No. 2....................lb.	.08	.09	....	....	.....	.....
Kauri, 224-226 lb cases No. 1 lb.	.20	.25	.20	.25	.20	.42
No. 2 fair pale..........lb.	.12½	.16	.12½	.16	.12½	.30
Brown Chips, 224-226 lb. cases...............lb.	.06½	.08½	.06½	.12	.10	.12
Bush Chips, 224-226 lb. cases...............lb.	.22	.24	.22	.24	.22	.24
Pale Chips, 224-226 lb cases ....lb.	.11	.14	.11	.14	.11	.14
Sandarac, prime quality, 200 lb. bags & 300 lb. casks.....lb.	.48	.50	.21	.50	.23	.25½
Senegal, picked bags.........lb.	.15	.16	....	....	.....	.....
Sorts.....................lb	.07¾	.08	....	....	.....	.....
Thus, bbls.............280 lbs.	.....	8.25	....	....	.....	.....
Strained...............280 lbs.	.....	8.25	....	....	.....	.....
Tragacanth, No. 1 bags......lb.	.....	1.00	.65	1.00	.....	.....
Yacca, bags.................lb.	.....	.04	....	....	.....	.....
Helium, 1 lit. bot............lit.	.....	25.00	....	25.00	.....	25.00
Hematine crystals, 400 lb bbls lb.	.16	.18	.10	.18	.10	.18
Paste, 500 bbls............lb.	.....	.11	....	.11	.....	.11
Hemlock 25%, 600 lb bbls wks lb.	.03½	.04½	.03½	.04½	.03	.04½
Bark.....................ton	.....	16.00	....	16.00	.....	16.00
Hexalene, 50 gal drs wks......lb.	.....	.30	....	.30	.30	.40
Hexane, normal 60-70° C. Group 3, tanks.........gal.	.....	.11	....	....	.....	.....
Hexamethylenetetramine, drs lb.	.37	.39	....	....	.....	.....
Hoof Meal, f.o.b. Chicago...unit	1.55	1.60	.75	1.75	.75	1.35
South Amer. to arrive....unit	1.55	1.75	1.40	1.75	1.25	1.65

Prices

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Hydrogen Peroxide, 100 vol, 140 lb cbys ... lb.	.20	.21	.20	.21	.20	.21
Hydroxyamine Hydrochloride lb.	.....	3.15	....	3.15	.....	3.15
Hypernic, 51°, 600 lb bbls ... lb.	.17	.20	.11	.20	.11	.12
Indigo Madras, bbls ... lb.	1.25	1.30	1.25	1.30	1.25	1.30
20% paste, drums ... lb.	.15	.18	.15	.18	.15	.18
Synthetic, liquid ... lb.	.....	12	....	.12	.....	.12
Iodine, crude ... per kilo	.....	15s 1d	....	....	.....	.....
Resublimed, kegs ... lb.	.....	2.40	2.10	3.40	.....	.....
Irish Moss, ord. bales ... lb.	.06	.07	....	....	.....	.....
Bleached, prime, bales ... lb.	.08	.12	....	....	.....	.....
Iron Chloride see Ferric or Ferrous						
Nitrate, kegs ... lb.	.09	.10	.09	.10	.09	10
Coml, bbls ... 100 lb.	2.75	3.25	2.50	3.25	2.50	3.25
Oxide, English ... lb.	.04½	.07	.04	.07	.04	.10
Japan Wax, 224 lb cases ... lb.	.07½	.08	.05½	.08	.06	.09
Kieselguhr, 95 lb bgs NY ... Brown ... ton	60.00	70.00	60.00	70.00	60.00	70 00
Lead Acetate, bbls wks ... 100 lb.	.....	9.50	8.50	9.50	9.00	10.00
White crystals, 500 lb bbls wks ... 100 lb.	.....	10.50	9.50	10.50	10.00	11.00
Arsenate, drs lc-1 wks ... lb.	.10	.10½	.09	.10½	09½	.13
Dithiofuroate, 100 lb dr ... lb.	.....	1.00	....	1.00	....	1.00
Linoleate, solid bbls ... lb.	.26	.26½	....	....	.....	.....
Metal, c-1 NY ... 100 lb.	.....	4.15	3.00	4.50	2.70	3.75
Nitrate, 500 lb bbls wks ... lb.	.10	.14	.10	.14	.10½	.14
Oleate, bbls ... lb.	.15	.16	.15	.16	.15	.18
Lead Oxide Litharge, 500 lb. bbls ... lb.	.....	.06¾	.05½	.07	.05½	.07
Red, 500 lb bbls wks ... lb.	.....	.07¼	.06½	.08	.06½	.07
Resinate, precip., bbls ... lb.	.18	.18½	....	....	.....	.....
Stearate, bbls ... lb.	.22	.23	....	....	.....	.....
White, 500 lb bbls wks ... lb.	.06½	.07	.06	.07	.06	.07
Sulfate, 500 lb bbls wk ... lb.	.....	.06	.05½	.06	.05½	.06
Leuna saltpetre, bags c.i f. ... ton	.....	Nom	....	Nom	.....	Nom.
S. points c.i f. ... ton	.....	Nom.	....	Nom.	.....	Nom.
Lime, ground stone bags ... ton	.....	4.50	....	4.50	.....	4.50
Live, 325 lb bbls wks ... bbl.	.....	1.70	....	....	.....	.....
Lime Salts, see Calcium Salts						
Lime-Sulfur soln bbls ... gal.	.15	.17	.15	.17	.15	.17
Linseed cake, bulk ... ton	24.50	25.00	17.50	27.50	.....	.....
Linseed Meal ... ton	.....	33.50	28.00	35.70	.....	.....
Lithopone, 400 lb bbls lc-1 wks ... lb.	.04½	.05	.04¾	.05	.04½	.05
Logwood, 51°, 600 lb bbls ... lb.	.08½	.12½	.05	.12½	.05	.08
Solid, 50 lb boxes ... lb	.13½	.17½	.08	.17½	.08	.12½
Sticks ... ton	24.00	26.00	24.00	26.00	24.00	26.00
Madder, Dutch ... lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbl ... ton	58.00	60.00	46.00	60.00	50.00	60.00
Magnesium Carb, tech, 70 lb. bags NY ... lb.	.05¾	.06½	.05¾	.06½	.05¾	.06½
Chloride flake, 375 lb. drs c-1 wks ... ton	34.00	36.00	34.00	36.00	35.00	36.00
Imported shipment ... ton	31.75	33.00	31.75	33.00	31.75	33.00
Fused, imp., 900 lb bbls NY ton	.....	31.00	....	31.00	.....	31.00
Fluosilicate, crys, 400 lb bbls wks ... lb.	.10	10½	.10	.10½	.10	.10½
Oxide, USP, light, 100 lb bbls ... lb.	.....	.42	....	.42	.....	.42
Heavy, 250 lb bbls ... lb.	.....	.50	....	.50	.....	.50
Palmitate, bbls ... lb.	.21	.22	....	....	.....	.....
Peroxide, 100 lb cs ... lb.	1.20	1.25	1.00	1.25	1.00	1.25
Silicofluoride, bbls ... lb.	.10	.11	.08¾	.11	.09¾	.10½
Stearate, bbls ... lb.	.19	.20	.16½	.20	.16½	.26
Manganese Borate, 30%, 200 lb bbls ... lb.	.15	.16	.15	.16	.15	.19
Chloride, 600 lb casks ... lb.	.07	.08	.07	.08	.07	.08½
Dioxide, tech (peroxide) drs lb.	.03¾	.06	.03½	.06	.03½	.06
Linoleate, liq. drums ... lb.	.18	.19	....	....	.....	.....
Resinate, fused, bbls ... lb.	.08¼	.08½	....	....	.....	.....
precip., bbls ... lb.	.11½	.12½	....	....	.....	.....
Sulfate, 550 lb drs NY ... lb.	.....	.08	.07	.08	.07	.08
Mangrove 55%, 400 lb bbls ... lb.	.....	.04	....	.04	.....	.04
Bark, African ... ton	29.00	30.50	22.00	30.50	21.00	25.00
Marble Flour, bulk ... ton	12.00	13.00	12.00	13.00	12.00	15.00
Mercuric chloride ... lb.	.82	.87	.67	.87	.67	.93
Mercury metal ... 76 lb flask	.....	68.00	48.00	68.00	47.00	74.50
Meta-nitro-aniline ... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-para-toluidine 200 lb. bbls ... lb.	1.40	1.55	1.40	1.55	1.40	1.55
Meta-phenylene-diamine 300 lb. bbls ... lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine, 300 lb. bbls ... lb.	.67	.69	.67	.69	.67	.69
Methanol, (Wood Alcohol) ...						
*Crude, tanks ... gal.	.....	.20	.20	.20	.....	.....
95% tanks ... gal.	.33	.35	.33	.35	.33	.35
97% tanks ... gal.	.34	.39	.34	.39	.34	.39
*Pure, Synthetic drums cars gal.	.....	.39½	.37½	.39½	.37½	.41½
*Synthetic tanks ... gal.	.....	.35½	....	.35½	.....	.35½
*Denat. grade, tanks ... gal.	.....	.40	.35	.40	.....	.....
Methyl Acetate drums 82% gal.	.12	.13	.12	.13	.12	.17½
99% ... gal.	.....	.15	.....	.15	.....	.15
Acetone, drums ... gal.	.54	.56	.42	.56	.47	.55
Hexyl Ketone, pure ... lb.	.....	1.20	....	1 20	.....	1.20
Anthraquinone ... lb.	.65	.67	.65	.67	.65	95
Cellosolve, (See Ethylene Glycol Mono Methyl Ether) ...		.....	....	....	.....	.....
Chloride, 90 lb cyl ... lb.	.45	.45	.45	.45	45	.45
Mica, dry grd. bags wks ... lb.	65.00	80.00	65.00	80.00	65.00	80.00
Michler's Ketone, kegs ... lb.	.....	2.50	2.50	3.00	.....	3 00
Molasses, blackstrap, tanks f.o.b. N. Y. ... gal.	.06½	.07	.04½	.07	.....	.....
Monochlorobenzene, drums see, Chlorobenzene, mono ... lb.						
Monomethylparaminosulfate 100 lb drums ... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Montan Wax, crude, bags ... lb.	.....	.09	.03¾	.09	.03¾	.07
Myrobalans 25%, liq bbls ... lb.	.03¾	.04½	.03¼	.04½	.03¾	.04½
50% Solid, 50 lb boxes ... lb.	.06	.06¼	.05	.06¼	.05	.05½

*delivered basis (east of Miss. River) †As of Sept. 1, $2.56

Current

	Current Market		1933 Low	1933 High	1932 Low	1932 High
J1 bags.....ton	.....	32.00	27.00	35.00	34.00	35.00
J2 bags.....ton	.....	21.00	15.50	22.75	15.25	18.50
R2 bags.....ton	.....	21.00	15.00	22.00	14.75	17.50
Naphtha, v.m.& p. (deodorized)						
tanks, Group 3 tanks...gal.	.06½	.07	....	....	.....	.....
Bayonne, tanks.....lb.	.....	.09½	.08½	09½	.08½	.10
Naphthalene balls, 250 lb bbls						
wks.....lb.	.06	.07	.05½	.07	.03¾	05¼
Crude, imp.....100 lb.	.....	1.96	1.75	1.96	.....	.....
Crushed, chipped bgs wks...lb.	.....	.05	....	.05	.....	.04½
Flakes, 175 lb bbls wks.....lb.	.....	.07¼	....	.07¼	.03¾	.04¾
Nickel Chloride, bbls.....lb.	.17	.18	.17	.18	.18	.20
Oxide, 100 lb kegs NY.....lb.	.35	.37	.35	.37	.35	.40
Salt bbl. 400 bbls lb NY...lb.	.12	.13	.11	.13	.10½	.13
Single, 400 lb bbls NY.....lb.	.12	.12	.11	.12	.10½	.12
Metal ingot.....lb.	.35	.35	.35	.35	.35	35
Nicotine, free 40%, 8 lb tins,						
cases.....	8.25	10.15	....	....	.....	.....
Sulfate, 55 lb. drums.....lb.	.67	.75	.67	.75	.74½	.....
Nitre Cake, bulk.....ton	12.00	14.00	10.00	14.00	10.0C	12.00
Nitrobenzene, redistilled, 1000						
lb drs wks*.....lb.	.08½	.11	.08½	.11	.09	.11
Nitrocellulose, c-l-l-cl, wks....lb.	.27	.33	.27	.33	.25	.36
Nitrogenous Material, bulk.unit	.....	2.45	1.50	3.50	1.35	1.55
Nitronaphthalene, 550 lb bbls.lb.	.24	.25	.24	.25	.....	25
Nutgalls Aleppy, bags.....lb.	.....	.18	....	.18	.....	.18
Chinese, bags.....lb.	.17	.18	.17	.18	.17	.18
Oak Bark, ground.....ton	30.00	35.00	30.00	35.00	30.00	35.00
Whole.....ton	20.00	23.00	20.00	23.00	20.00	23.00
Extract, 25% tannin, bbls..lb.	.03⅜	.03½	....	....	.....	.....
Orange-Mineral, 1100 lb casks						
NY.....lb.	.....	.10½	09½	.10¾	.09½	.10¾
Orthoaminophenol, 50 lb kgs..lb.	2.15	2.25	2.15	2.25	2 15	2.25
Orthoanisidine, 100 lb drs....lb.	1.00	1.15	1.00	1.15	1.15	1.50
Orthochlorophenol, drums....lb.	.50	.65	.50	.65	.50	.65
Orthocresol, drums.....lb.	.13	.15	.13	.15	.13	.22
Orthodichlorobenzene, 1000 lb.						
drums.....lb.	.05½	.06	05½	.06	07	.10
Orthonitrochlorobenzene, 1200						
lb drs wks.....lb.	.28	.29	.28	.29	28	29
Orthonitrotoluene, 1000 lb drs						
wk.....lb.	.05½	.06	.05½	.06	.14	.18
Orthonitrophenol, 350 lb dr...lb.	.52	.80	.52	.90	.85	.90
Orthotoluidine, 350 lb bbl 1c-1 lb.	.14	.15	.14	.22	.20	22
Orthonitroparachlorphenol, tins						
.....lb.	.70	.75	.70	.75	.70	.75
Osage Orange, crystals.....lb.	.16	.17	.16	.17	.16	.17
51 deg. liquid.....lb.	.07	.07¾	.06	.07¾	.06	.07½
Powdered, 100 lb bags.....lb.	.14½	.15	.14½	.15	14½	.15
Paraffin, refd, 200 lb cs slabs						
123-127 deg. M. P.....lb.	.04½	.04½	.02	.04½	.02⅝	.03
128-132 deg. M. P.....lb.	.....	.04¾	.03⅛	.04¾	.....	.03¼
133-137 deg. M. P.....lb.	.....	.05¾	.043	.05¾	.04	.04¼
Para Aldehyde, 110-55 gal drs.lb.	.20½	.23	.20½	.23	.20½	.23
Aminoacetanilid, 100 lb bg..lb.	.52	.60	.52	.60	.52	.60
Aminohydrochloride, 100 lb.						
kegs.....lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kegs...lb.	.78	.80	.78	.80	.78	.80
Chlorophenol, drums.....lb.	.50	.65	.50	.65	.50	.65
Coumarone, 330 lb drums..lb.	.....	.....	....	....	.....	.....
Cymene, refd, 110 gal dr..gal.	2.25	2.50	2.25	2.50	2.25	2.50
Dichlorobenzene, 150 lb bbls						
wks.....lb.	.16	.18	.15	.18	.15½	.16
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls wks						
.....lb.	.48	.55	.48	.55	.48	.55
Nitrochlorobenzene, 1200 lb drs						
wks.....lb.	.23½	.24	.23½	.26	.23	.26
Nitro-orthotoluidine, 300 lb.						
bbls.....lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol 185 lb bbls.....lb.	.45	.50	.45	.50	.45	.50
Nitrosodimethylaniline, 120 lb.						
bbls.....lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls...lb.	.35	.37	.29	.37	.29	.31
Phenylenediamine, 350 lb bbls						
.....lb.	1.25	1.30	1.15	1.30	1.15	1.20
Toluenesulfonamide, 175 lb						
bbls.....lb.	.70	.75	.70	.75	.70	.75
Toluenesulfonchloride, 410 lb						
bbls wks.....lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls wk..lb.	.56	.60	.56	.60	.42	.43
Paris Green, Arsenic Basis						
100 lb kegs.....lb.	.....	.24	....	.24	.24	.27
250 lb kegs.....lb.	.....	.23	....	.23	.23	.25
Persian Berry Ext., bbls.....lb.	.25	Nom	.25	Nom	.25	Nom.
Pentane, normal, 28-38° C, group						
3, tanks.....gal.	.....	.07	....	....	.....	.....
Pentasol (see Alcohol, Amyl)...						
Pentasol Acetate (see Amyl Acetate).....						
Petrolatum, Green, 300 lb bbl. lb.	.01⅞	.02	.01⅞	.02	.02	.02½
Petroleum Ethers, tanks 30-60°,						
Group 3.....gal.	.....	.10	....	.10	.....	.....
Petroleum solvents and diluents						
Cleaners' naphtha, Group 3,						
tanks.....gal.	.07	.07½	.05	.07¾	.....	.....
Lacquer diluents, Bayonne						
tanks.....gal.	.12	.12½	.12	.12¾	.....	.....
Group 3, tanks.....gal.	.08	.08½	.06¼	.08⅛	.....	.....
Petroleum thinner 47-49 deg.						
tanks, Group 3.....gal.	.05½	.06	....	....	.....	.....
Rubber solvent, stand. grade						
tanks, Group 3.....gal.	.....	.06¾	.05	.06⅞	.....	.....
East Coast tanks.....gal.	.....	.09½	.09	.09½	.....	.....
Stoddard solvents 48-50 deg.						
tanks, Group 3.....gal.	.....	.05½	.04½	.06	.....	.....
East Coast tanks.....gal.	.....	.09½	.09	.09½	.....	.....
Phenol, 250-100 lb drums....lb.	.14¼	.15	.14¼	.15	.14¼	.15
Phenyl-Alpha-Naphthylamine,						
100 lb kegs.....lb.	.....	1.35	....	1.35	....	1.35

*Higher price is for lcl quantities.

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Phenyl Chloride, drums lb.		.16	....	....	.. ..	.....
Phenylhydrazine Hydrochloride lb.	2.90	3.00	2.90	3.00	2.90	3.00
Phosphate Acid (see Superphosphate)						
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	2.80	3.20*	2.75	3.25	3.10	3.25
70% basis ton	3.30	3.70*	3.25	3.90	3.75	3.90
72% basis ton	3.80	4.20*	3.75	4.35	4.25	4.35
75-74% basis ton	4.85	5.30*	4.75	5.50	5.25	5.50
75% basis ton	4.95	5.40*	4.85	5.75	.....	5.75
77-80% basis ton	5.75	6.20*	5.75	6.30	.....	6.25
Tennessee, 72% basis ton	.....	5.00*	....	5.00	.....	5.00
Phosphorous Oxychloride 175 lb cyl lb.	.16	.20	.16	.23	.18	.20
Red, 110 lb cases lb.	.....	.45	.40	.45	.40	.46
Yellow, 110 lb cases wks. lb.	.28	.33	.27½	.33	.27½	.37½
Sesquisulfide, 100 lb cs lb.	.38	.44	.38	.44	38	.44
Trichloride, cylinders lb.	.16	.20	.16	.23	.18	.20
Phthalic Anhydride, 100 lb bbls wks lb.	.14½	.15	.13½	.16	15	.16
Pigments Metallic, Red or brown bags, bbls, Pa. wks ton	37.00	45.00	37.00	45.00	37.00	45.00
Pine Oil, 55 gal drums or bbls						
Destructive dist lb.	.59	.62	.59	.62	.59	.63
Prime bbls bbl.	8.00	10.60	8.00	10.60	8.00	10.60
Steam dist. bbls gal	.....	.59	.52	.59	.54	.61
Pitch Hardwood wks ton	.....	20.00	20.00	25.00	20.00	35.00
Plaster Paris, tech, 250 lb bbls bbl.	3.40	3.50	3.30	3.50	3.30	3.50
Platinum, Refined oz.	37.00	38.00	24.00	38.00	32.00	38.00
Pontol, tanks per gal.	.....	.54	....	.54	.54	.54
Potash, Caustic, wks, solid lb.	.07⅛	07⅜	.06⅛	.07⅜	.06⅛	.06⅜
flake lb.	.0803	.08¼	.0705	.08¼	.0705	.08
Liquid, tanks lb.	.....	.03⅜	....	....	.....	.....
Potash Salts, Rough Kainit						
12.4% basis bulk ton	.....	9.20	....	9.20	.....	9.20
14% basis ton	.....	9.70	....	9.70	.....	9.70
Manure Salts						
20% basis bulk ton	.....	12.00	....	12.00	12.00	12.65
30% basis bulk ton	.....	19.15	....	19.15	.....	19.15
Potassium Acetate lb.	.27	.28	.27	.28	.27	.28
Potassium Muriate, 80% basis bags ton	.....	37.15	....	37.15	.....	37.15
Pot. & Mag. Sulfate, 48% basis bags ton	.....	25.00	25.00	27.80	.....	27.80
Potassium Sulfate, 90% basis bags ton	....	42.15	42.15	47.50	47.50	48.25
Potassium Bicarbonate, USP, 320 lb bbls lb.	.07½	.09	.07½	.09	.07½	.09
Bichromate Crystals, 725 lb casks lb.	.08⅛	.08⅝	.07½	.08⅝	.07	.08½
Binoxalate, 300 lb bbls lb.	.14	.17	.14	.17	.14	.17
Bisulfate, 100 lb kegs lb.	.16	.30	.16	.30	.16	.30
Carbonate, 80-85% calc. 800 lb casks lb.	.07	.07½	.04¾	.07½	.0475	.05
Chlorate crystals, powder 112 lb keg wks lb.	.08½	.09	.08	.09	.08	.08½
Chloride, crys bbls lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kegs lb.	.23	.28	.23	.28	.23	.28
Cyanide, 110 lb. cases lb.	.55	.60	.50	.60	.50	.57½
Iodide, 75 lb. bbls lb.	.....	2.70	2.35	2.70	.....	.....
Metabisulfite, 300 lb. bbl. lb.	.10½	.11	.10½	.11	.10½	.13
Oxalate, bbls lb.	.16	.24	.16	.24	.16	.24
Perchlorate, casks wks lb.	.09	.11	.09	.11	.09	.11
Permanganate, USP, crys 500 & 100 lb drs wks lb.	. ..	.17½	.16	.17½	.16	.16½
Prussiate, red, 112 lb keg lb.	.....	.35	.32½	.38½	.....	.38½
Yellow, 500 lb casks lb.	.16½	.17½	.16½	.17½	.16½	.21
Tartrate Neut, 100 lb keg lb.	.....	.21	....	.21	.....	.21
Titanium Oxalate, 200 lb bbls lb.	.32	.35	....	....	.....	.....
Propane, group 3, tanks		.07	....	.07	.....	.....
Pumice Stone, lump bags lb.	.04½	.06	.04	.06	.04	.05
250 lb bbls lb.	.05	.07	.04½	.07	.04½	.06
Powdered, 350 lb bags lb.	.02½	.03	.02½	.03	.02½	.03
Putty, commercial, tubs 100 lb.	.....	2.25	2.00	2.25	2.00	2.45
Linseed Oil, kegs 100 lb.	4.00	4.50	3.40	4.50	3.40	4.75
Pyridine, 50 gal drums gal.	.85	.95	.85	.95	.85	1.2
Pyrites, Spanish cif Atlantic ports bulk unit	.12	.13	.12	.13	.12	.13
Quebracho, 35% liquid tks lb.	.....	.02¾	.02	.02⅜	.02	.03
450 lb bbls c-1 lb.	.....	.02⅞	.02⅜	.02⅞	.02½	.03⅜
Solid, 63%, 100 lb bales cif lb	.....	.03⅜	.02⅜	.03⅜	.02	.02⅞
Clarified, 64%, bales lb.	.....	.03½	.02⅜	.03½	.02½	.03⅛
Quercitron, 51 deg liquid 450 lb bbls lb.	.05½	.06	.05½	.06	.05½	.06
Solid, 100 lb boxes lb.	.09½	.13	.09½	.13	.09½	.12
Bark, Rough ton	.....	14.00	....	14.00	.....	14.00
Ground ton	34.00	35.00	34.00	35.00	34.00	35.00
R Salt, 250 lb bbls wks lb.	.40	.44	.40	.44	40	.44
Red Sanders Wood, grd bbls. lb.	.....	.18	....	.18	.....	.18
Resorcinol Tech, cans lb.	.65	.70	.65	.70	.65	.70
Rochelle Salt, cryst lb.	.....	.12½	....	....	.....	.....
Rosin Oil, 50 gal bbls, first run gal.	.45	.46	.42	.46	.41	.45
Second run gal.	.50	.51	.46	.51	.45	.51

Rosin

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Rosins 600 lb bbls 280 lb. unit ex. yard N. Y.						
B		4.80	2.75	5.15	2.95	3.65
D		4.85	2.95	5.15	3.15	3.75
E		4.90	3.55	5.15	3.37½	4.00
F		4.92½	3.85	5.17½	3.40	4.15
G		4.95	3.90	5.17½	3.45	4.15
H		5.00	4.00	5.17½	3.45	4.20
I		5.07½	4.05	5.20	3.47½	4.25
K		5.15	4.60	5.20	3.60	4.65
M		5.25	4.35	5.25	4.20	5.25
N		5.40	4.75	5.40	4.65	6.05

*Higher prices run to Jan.-June 1935.

Current

Rosin
Starch, Potato

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Rosin, WG		5.45	4.80	5.60	5.25	6.45
WW		5.85	4.85	6.20	5.85	6.65
Rotten Stone, bags mines....ton	23.50	24.00	23.50	24.00	20.00	23.00
Lump, imported, bbls......lb.	.05	.07	.05	.07	.05	.07
Selected bbls...........lb.	.09	.12	.09	.12	.09	.2
Powdered, bbls...........lb.	.02½	.05	.02	.05	.02	.05
Sago Flour, 150 lb bags......lb.	.02½	.03	.02½	.03	.02½	.04
Sal Soda, bbls wks......100 lb.	1.10	1.10	.90	1.10	.90	1.00
Salt Cake, 94-96% c-1 wks...ton	13.00	18.00	13.00	18.00	13.00	15.50
Chrome...............ton	12.00	13.00	12.00	13.00	12.00	14.50
Saltpetre, double refd granular 450-500 lb bbls..........lb.	.....	.06	.05¾	.06¾	.06	.06¾
Satin, White, 500 lb bbls.....lb.	.....	.01½	....	.01½	.....	.01½
Shellac Bone dry bbls........lb.	.....	.24	.18	.24	.16	.26
Garnet, bags.............lb.	.16	.17	.15	.20	.15	.20
Superfine, bags...........lb.	.16	.16¾	.09½	.18¾	.10	.14
T. N. bags...............lb.	.15	.15¾	.08½	.17¾	.09	.13
Schaeffer's Salt kegs........lb.	.48	.50	.48	.50	.48	.50
Silica, Crude, bulk mines....ton	8.00	11.00	8.00	11.00	8.00	11.00
Refined, floated bags......ton	22.00	30.00	22.00	30.00	22.00	30.00
Air floated bags.........ton	.....	32.00	....	32.00	.....	32.00
Extra floated bags......ton	30.00	35.00	30.00	35.00	30.00	40.00
Silver Nitrate, vials.........oz.	.....	.31⅞	....	....	.....	.....
Soapstone, Powdered, bags f.o.b. mines.................ton	15.00	22.00	15.00	22.00	15.00	22.00
Soda Ash, 58% dense, bags c-1 wks...............100 lb.	.....	1.25	1.17½	1.25	1.17½	....
58% light, bags.......100 lb.	.....	1.23	1.15	1.23	1.15	1.20
Soda Caustic, 76% grnd & flake drums.............100 lb.	.....	3.00	2.90	3.00	2.90	3.00
76% solid drs.........100 lb.	.....	2.60	2.50	2.60	2.50	2.55
Liquid sellers tanks, 100 bls.	.....	2.25	2.15	2.25	.....	.....
Sodium Abietate, drs........lb.	.....	.03	....	.03	.....	.03
Acetate, tech 450 lb. bbls wks lb.	.04¾	.05	.04½	.05	.04½	.05
Alignate, drs..............lb.	.....	.50	....	.50	.....	.50
Arsenate, drums...........lb.	.07¾	.08¾	.07¾	.08¾	.....	.....
Arsenite, drums..........gal.	.50	.75	.05	.75	.50	.75
Benzoate U.S.P., kegs......lb.	.45	.47	....	....	.....	.....
Bicarb, 400 lb bbl.....100 lb.	.....	2.25	....	2.25	.....	2.25
Bichromate, 500 lb cks wks lb.	.06⅛	.06⅝	.044	.07	.044	.05¾
Bisulfite, 500 lb bbl wks....lb.	.03	.0335	.02¾	.0335	.03	.34
Chlorate, wks............lb.	.05¾	.07¾	.05¾	.07¾	.05¾	.07¾
Chloride, technical.......ton	11.40	14.00	11.40	14.00	12.00	13.00
Cyanide, 96-98%, 100 & 250 lb drums wks...........lb.	.15½	.16	.15½	.16	.15½	.17
Fluoride, 300 lb bbls wks....lb.	.....	.07½	.07	.07½	.07	.07½
Hydrosulfite, 200 lb bbls f.o.b. wks................lb.	.20	.21	.20	.21	.21	.24
Hypochloride solution, 100 lb. cbys................lb.	.....	.05	....	.05	.....	.05
Hyposulfite, tech, pea cyrs 375 lb bbls wks......100 lb.	2.40	3.00	2.40	3.00	2.40	3.00
Technical, regular crystals 375 lb bbls wks....100 lb.	2.40	2.65	2.40	2.65	2.40	2.65
Iodide,....................lb.	.....	3.50	3.10	3.50	.....	.....
Metanilate, 150 lb bbls....lb.	.44	.45	.44	.45	.44	.45
Metasilicate, c-1, wks..100 lb.	2.65	3.05	2.65	3.25	2.85	4.00
Monohydrate, bbls..........lb.	.....	.02½	....	.02½	.....	.02½
Naphthionate, 300 lb bbl...lb.	.52	.54	.52	.54	.52	.54
Nitrate, 92%, crude, 200 lb. bags c-1 NY .....100 lb.	.....	1.26	1.26	1.31	1.185	1.73½
100 lb. bags lb.......ton	.....	25.90	....	....	.....	.....
Bulk..................ton	.....	23.90	....	....	.....	.....
Nitrite, 500 lb bbls spot....lb.	.07½	.08	.07½	.08	.07½	.08
Orthochlorotoluene, sulfonate, 175 lb bbls wks.......lb.	.25	.27	.25	.27	.25	.27
Perborate, 275 lb bbls.....lb	.17	.19	.17	.19	.17	.20
Peroxide, bbls. 400 lb. ....lb.	.....	.17	....	....	.....	.....
Phosphate, di-sodium, tech. 310 lb bbls.......100 lb.	2.20	2.40	2.00	2.40	2.00	2.75
tri-sodium, tech, 325 lb bbls...............100 lb.	.....	2.60	2.15	2.50	2.15	3.20
Picramate, 160 lb kegs ....lb.	.69	.72	.69	.72	.69	.72
Prussiate, Yellow, 350 lb bb wks.................lb.	.11½	.12	.11½	.12	.11½	.12
Pyrophosphate, 100 lb keg..lb.	.15	.20	.15	.20	.15	.20
Silicate, 60 deg 55 gal drs, wks ....100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40 deg 55 gal drs, wks ....100 lb.	.....	.80*	.75	.80	.....	.75
Silicofluoride, 450 lb bbls NY ....lb.	.05	.06	.04½	.06	.05½	.06¾
Stannate, 100 lb drums.....lb.	.35	.37	.18	.37	.17	.19
Stearate, bbls.............lb.	.20	.25	.20	.25	.20	.25
Sulfanilate, 400 lb bbls.....lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bbls c-1 wks..............lb.	.022	.0285	.02	.0285	.02	.02¾
Sulfide, 80% crystals, 440 lb bbls wks.............lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
62% solid, 650 lb drums 1c-1 wks.............lb.	.03	.03½	.03	.03½	.03	.03½
Sulfite, crystals, 400 lb bbls wks.................lb.	.03	.03½	.03	.03½	.03	.03½
Sulfocyanide, bbls ....lb.	.28	.35	.28	.35	.28	.35
Tungstate, tech, crystals, kegs ....lb.	.65	.67	.57	.67	.60	.88
Spermaceti, blocks, cases.....lb.	.19	.20	.17	.22	.....	.....
Cakes, cases..............lb.	.20	.21	.18	.23	.....	.....
Spruce Extract, ord., tanks..lb.	.....	.01	.00⅞	.01	.00⅞	.01
Ordinary, bbls...........lb.	.....	.01½	.01¼	.01½	.01¼	.01¾
Super spruce ext., tanks...lb.	.....	.01⅝	.01¼	.01⅝	.01¼	.01⅝
Super spruce ext., bbls....lb.	.....	.01⅞	.01⅝	.01⅞	.01⅝	.01¾
Super spruce ext. powd., bags ....lb.	.....	.04	....	.04	.04	.04½
Starch, powd, 140 lb bags ....100 lb.	2.81	3.01	2.29	3.01	2.29	2.67
Pearl, 140 lb bags.....100 lb.	2.71	2.91	2.19	2.91	2.19	2.84
Potato, 200 lb bags........lb.	.05½	.06	.03¾	.06	.03¾	.06
Imported bags.........lb.	.06	.06½	.04¾	.06½	.04	.06½

*Tanks, 5c less.

Prices

		Current Market		1933 Low	1933 High	1932 Low	1932 High
Starch, Potato Soluble	lb.	.08	.08½	.08	.08½	.08	.08½
Rice, 200 lb bbls	lb.	.07½	.08½	.07	.08½	.07½	.10
Wheat, thick bags	lb.	.06¼	.06¾	.05¾	.06¾	.06	.07
Thin bags	lb.	.10	.10¼	.09½	.10¼	.09½	.10
Strontium carbonate, 600 lb bbls wks	lb.	.07½	.07½	.07¼	.07½	.07¼	.07½
Nitrate, 600 lb bbls NY	lb.	.10½	.11	.07	.11	.07	.07½
Peroxide, 100 lb drs	lb.	....	1.25	....	1.25	.....	1.25
Sulfur Brimstone, broken rock, 250 lb bag c-1	100 lb.	....	2.05	....	2.05	.....	2.05
Crude, f. o. b. mines	ton	18.00	19.00	18.00	19.00	18.00	19.00
Flour for dusting 99½%, 100 lb bags c-1 NY	100 lb.	....	2.40	....	2.40	.....	2 40
Heavy bags c-1	100 lb.	....	2.50	....	2.50	.....	2.50
Flowers, 100%, 155 lb bbls c-1 NY	100 lb.	....	3.45	....	3.45	...	3.45
Roll, bbls 1c-1 NY	100 lb.	2.65	2.85	2.65	2.85	2.65	2.85
Sulfur Chloride, red, 700 lb drs wks	lb.	.05	.05½	.05	.05½	05	.05½
Yellow, 700 lb drs wks	lb.	.03½	.04½	.03½	.04½	.03½	.04½
Sulfur Dioxide, 150 lb cyl	lb.	.07	.08	.07	.08	.07	.07½
Extra, dry, 100 lb cyl	lb.	.11	.13	.10	.13	.10	.12
Sulfuryl Chloride	lb.	.15	.40	.15	.40	.15	.40
Sumac, ground	ton	66.00	68.00	50.00	68.00	....	.....
Talc, Crude, 100 lb bgs NY	ton	12.00	15.00	12.00	15.00	12.00	15.00
Refined, 100 lb bgs NY	ton	16.00	18.00	16.00	18.00	16.00	18.00
French, 220 lb bags NY	ton	27.50	30.00	18.00	30.00	18.00	22.00
Refined, white, bags	ton	45.00	60.00	35.00	60.00	35.00	40.00
Italian, 220 lb bags to arr.	ton	70.00	75.00	48.50	75.00	40.00	50.00
Refined, white bags N.Y.	ton	75.00	80.00	50.00	80.00	50.00	55.00
Superphosphate, 16% bulk, wks	ton	.....	8.00	6.50	8.00	7.00	8.00
Run of pile	ton	.....	7.50	6.00	7.50	.....	.....
Tankage Ground NY	unit	.....	2.50*	1.70	2.75*	1.30	1.50
Unground	unit	.....	2.25	2.35	2.60	.....	.....
High grade f.o.b. Chicago	unit	.....	2.00*	1.40	3.00	1.00	1.80
South American cif	unit	.....	3.00*	....	2.50	1.80	2.25
Tapioca Flour, high grade bgs	lb	.03	.05	.03	.05	.03½	.05
Medium grade, bags	lb.	.03	.04	.03	.04	.03	04
Tar Acid Oil, 15%, drums	gal.	.21	.22	.21	.22	.21	.22
25% drums	gal.	.23	.24	.23	.24	.23	.24
Tartar Emetic, Tech	gal.	.....	.21¾	....	....	....	.....
U. S. P.	gal.	.....	.27	....	....	....	.....
Terra Alba Amer. No. 1, bgs or bbls mills	100 lb.	1.15	1.75	1.15	1.75	1.15	1.75
No. 2 bags or bbls	100 lb.	1.00	1.25	1.00	1.25	1.50	2.00
Imported bags	lb.	.01⅛	.01¼	.01⅛	.01¼	.01⅛	.01¼
Tetrachlorethane, 50 gal dr	lb.	.08½	.09	.08½	.09	.08	.09½
Tetralene, 50 gal drs wks	lb.	.12	.13	.12	.13	.12	.20
Thiocarbanilid, 170 lb bbl	lb.	.25	.28½	.25	.28½	.25	.28½
Tin							
Crystals, 500 lb bbls wks	lb.	.....	.39	.24	.41	.22	.25
Metal Straits NY	lb.	.....	.53¼	.23	.57	.211	.24½
Oxide, 300 lb bbls wks	lb.	.53	.55	.27½	.55	.23	.26½
Tetrachloride, 100 lb drs wks	lb.	.27	.28	.126	.28	.1420	.1457
Titanium Dioxide 300 lb bbl	lb.	.17¼	.19¼	.17¼	.19¼	.17¼	.21
Calcium Pigment, bbls	lb.	.06¼	.06½	.06¼	.06½	.06¼	.07¾
Toluene, 110 gal drs	gal.	.....	.35	....	.35	.....	.35
8000 gal tank cars wks	gal.	.....	.30	....	.30	.....	.30
Toluidine, 350 lb bbls	lb.	.88	.89	.88	.89	.88	.89
Mixed, 900 lb drs wks	lb.	.27	.28	.27	.28	.27	.32
Toner Lithol, red, bbls	lb.	.80	.85	.80	.95	.90	.95
Para, red, bbls	lb.	.....	.80	....	.80	.....	.80
Toluidine	lb.	.....	1.35	1.35	1.55	1.50	1.55
Triacetin, 50 gal drs wks	lb.	.32	.36	.32	.36	.32	.36
Trichlorethylene, 50 gal dr	lb.	.09½	.10	.09½	.10	.10	.10½
Triethanolamine, 50 gal drs	lb.	.35	.38	.35	.38	.35	.42
Tricresyl Phosphate, drs	lb.	.19	.26	.19	.26	.21	.26
Triphenyl guanidine	lb.	.58	.60	.58	.60	.58	.60
Phosphate, drums	lb.	.37	.39	.37	.39	.50	.65
Tripoli, 500 lb bbls	100 lb.	.75	2.00	.75	2.00	.75	2.00
Tungsten. Wolframite	per unit	12.00	12.50	10.00	12.50	10.00	11.75
Turpentine carlots, N. Y. dock bbls.	gal.	.47¼	.47½	.46¼	.51½	.39	.47¾
Savannah, bbls	gal.	.....	.42¼	....	....	.....	.....
Jacksonville, bbls	gal.	.42¼	.42½	....	....	.....	.....
Wood Steam dist, bbls	gal.	.....	.44	.42	.48	.42	.46
Urea, pure, 112 lb cases	lb.	.15	.17	.15	.17	.15	.17
Fert. grade, bags c.i.f.	ton	.....	90.00	82.60	90.00	.....	82.60
c. i. f. S. points	ton	.....	90.00	82.60	90 00	.....	82.60
Urea Ammonia liq. 55% NH_3, tanks,	unit	.....	.96	....	....	.....	.....
Valonia Beard, 42%, tannin bags	ton	39.50	41.00	27.50	'42.00	28.50	34.00
Cups, 30-31% tannin	ton	.....	25.00	17.00	25.00	19.00	23.50
Mixture, bark, bags	ton	.....	28.00	22.00	28.00	22.00	26.00
Vermillion, English, kegs	lb.	1.41	1.42	1.05	1.42	1.28	1.80
Vinyl Chloride, 16 lb cyl	lb.	.....	1.00	....	1.00	.....	1.00
Wattle Bark, bags	ton	35.00	36.00	24.00	32.00	26.00	33.00
Extract 55%, tanks, bbls.	lb.	.....	.05⅞	.03	.05⅞	.03	.06½
Whiting, 200 lb bags, c-1 wks	100 lb.	.85	1.00	.85	1.00	.85	1.00
Alba, bags c-1 NY	ton	.....	15.00	13.00	15.00	.....	13.00
Gilders, bags c-1 NY	100 lb.	.....	1.35	....	1.35	.....	1.35
Wood Flour, c-l	bags	18.00†	30.00	18.00	36.00	.....	.....
Xylene, 10 deg tanks wks	gal.	.....	.29	.29	.29	.....	.29
Commercial, tanks wks	gal.	.....	.26	....	.26	.....	.26
Xylidine, crude	lb.	.36	.37	.36	.37	.36	.37
Zinc Ammonium Chloride powd., 400 lb bbls	lb.	.04¾	.05	.04¾	.05	.....	5.75
Carbonate Tech. bbls NY	lb.	.09½	.11	.09½	.11	.09½	.11
Chloride Fused, 600 lb drs wks	lb.	.05	.05¾	.05	.05¾	.05	.06
Gran, 500 lb bbls wks	lb.	.05⅝	.06	.05⅝	.06	.05⅝	.06
Soln 50%, tanks wks	100 lb.	.....	3.00	....	3.00	2.25	3.00
Cyanide, 100 lb drums	lb.	.38	.39	.38	.39	.38	.39
Dithiofuroate, 100 lb dr.	lb.	.....	1 00	....	1.00	.....	1.00

*&10 †Depends upon grade

Current

Zinc Dust
Whale Oil

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Zinc Dust, 500 lb bbls c-1 wks ....lb.	.0705	.071	.04¾	.07½	.041	0525
Metal, high grade slabs c-1 NY ....100 lb.	.....	4.87	3.02	5.37	2.87	3.52
Oxide, American bags wk...lb.	.05¾	.06	.05	.06	.0485	.07
French, 300 lb bbls wks...lb.	.05¾	.11⅛	.05¾	.11⅛	.08⅜	.11⅜
Palmitate, bbls....lb.	.20	.21	.17½	.21	.....	.....
Perborate, 100 lb drs....lb.	.....	1.25	....	1.25	.....	1.25
Peroxide, 100 lb drs....lb.	.....	1.25	....	1.25	.....	1.25
Resinate, fused, dark, bbls. lb.	.05¾	.06½	.05¾	.06½	.....	.....
Stearate, 50 lb bbls....lb.	.18	.19	.15	.19	.16	.22
Sulfate, 400 bbl wks....lb.	.03¼	.03½	.03	.03½	.03	.03½
Sulfide, 500 lb bbls....lb.	.13	.13½	.12	.13½	.12	.13½
Sulfocarbolate, 100 lb keg..lb.	.21	.22	.21	.22	.21	.24
Zirconium Oxide, Nat. kegs...lb.	.02½	.03	.02½	.03	.02½	.03
Pure kegs....lb.	.45	.50	.45	.50	.45	.50
Semi-refined kegs....lb.	.08	.10	.08	.10	.08	.10

Oils and Fats

	Current Market		1933 Low	1933 High	1932 Low	1932 High
Castor, No. 1, 400 lb bbls....lb.	.....	.09¾	.09¼	.10	.09½	.10¼
No. 3, 400 lb bbls....lb.	.....	.09¾	.08½	.09¾	.08¾	.10½
Blown, 400 lb bbls....lb.	.12¼	.12¾	.11¼	.12¾	.11¼	.12½
China Wood, bbls spot NY...lb.	.07¾	.08	.04¼	.09⅛	.05½	.07¾
Tanks, spot NY....lb.	.073	.075	.04¼	.08½	.04½	.06⅞
Coast, tanks....lb.	.07	.07⅛	.04⅛	.08⅛	.04¼	.06½
Coconut, edible, bbls NY....lb.	.....	.10¾	....	.10¾	.....	.10¾
Ceylon, 375 lb bbls NY....lb.	.04	.04⅞	.03⅞	.04¾	.04	.04¾
8000 gal tanks NY....lb.	.02⅞	.03	.02⅞	.03⅜	.02⅞	.03⅞
Cochin, 375 lb bbls NY....lb.	.04⅝	.04¾	.04½	.05¼	.04½	.06
TanksN Y....lb.	.04¼	Nom.	.04	.05	.03½	.05
Manila, bbls NY....lb.	.04	.04⅛	.04	.04¾	.04	.05
Tanks NY....lb.	.03⅛	.03¼	.03⅛	.03¾	.03¼	.04
Tanks, Pacific Coast....lb.	.02⅞	.03	.02¾	.03⅜	.02⅞	.03½
Cod, Newfoundland, 50 gal bbls ....gal.	34	.35	.19	.35	.21	.30
Copra, bags, N. Y....lb.	.01575	.016	.0152½	.019	.0175	.0235
Corn, crude, bbls NY....lb.	05¼	.05½	.05¼	.07¾	.04½	.09
Tanks, mills....lb.	.04	04⅛	.02⅞	.06½	.02¾	.04½
Refined, 375 lb bbls NY...lb.	.06¼	.06½	.06¼	.08¾	.05½	.07
Cottonseed, crude, mill Southeast & Valley....lb.	(See Oils and Fats News Section)					
Texas....lb.	(See Oils and Fats News Section)					
Degras, American, 50 gal bbls NY....lb.	.02¾	.03	.02½	.03	.02½	.04
English, brown, bbls NY...lb.	.03¾	.04	.02⅞	.04	.02⅞	.04
Greases, Brown....lb.	.03	.03⅛	.02	.03⅛	.01⅜	.02¾
Yellow....lb.	.03	.03⅛	.01¾	.03⅜	.01⅜	.03
White, choice bbls NY....lb.	.03¼	.03¾	.02½	.04⅝	.02	.04½
Herring, Coast, Tanks....gal.	.17	Nom.	.11	.23	.....	.....
Lard Oil, edible, prime....lb.	.....	.10½	.08½	.10½	.08¼	.10
Extra, bbls....lb.	.....	.07¾	.07½	.08¼	.05¾	.07¾
Extra No. 1, bbls....lb.	.07¼	.07½	.06	.08	.05½	.07
Linseed, Raw, lessthan5bbl.lots lb.	.....	.107	.08	.12	.061	.078
Bbls c-1 spot....lb.	.....	.099	.072	.11	.053	.07
Tanks....lb.	.....	.093	.066	.104	.047	.064
Menhaden Tanks, Baltimore.gal.	.17	Nom.	.09	.15	.09½	.20
Refined, alkali bbl....lb.	.065	.071	....	....	....	.....
Tanks....lb.	.....	.061	....	....	....	.....
Light Pressed, bbls....lb.	.053	....	....	....	....	.....
Tanks....lb.	.....	.049	....	....	....	.....
Neatsfoot, CT, 20° bbls NY...lb.	.....	.16½	.11¾	.16¾	.11¼	.13½
Extra, bbls NY....lb.	.....	.07¾	.06½	.08¼	.05¾	.07
Pure, bbls NY....lb.	.....	.13	.07¾	.14	.07¾	.09
Oleo, No. 1, bbls NY....lb.	.....	.06¼	.05	.06⅞	.05⅜	.07
No. 2, bbls NY....lb.	.....	.05⅜	.04¼	.06⅜	.04¾	.06
Olive, denatured, bbls NY...gal.	.77	.80	.47	.80	.51	65
Edible, bbls NY....gal.	1.60	1.85	1.30	1.85	1.25	2.00
Foots, bbls NY....lb.	.06⅜	.06½	.04⅜	.06¾	.04¼	.05
Palm, Kernel Casks....lb.	.04¼	Nom.	.04	.04¾	.035	.04⅜
Lagos, 1500 lb casks....lb.	.....	.04	.02⅝	.04¾	.03	.05
Niger, Casks....lb.	.....	.03¾	.024	.04½	.03	.03½
Peanut, crude, bbls NY....lb.	.07	Nom.	.03⅛	.07	.02¾	.04½
Refined, bbls NY....lb.	.08	.11	.08½	.11	.08½	.09
Perilla, bbls NY....lb.	.09	.09½	.05	.10½	.03¾	.05¾
Tanks, Coast....lb.	.07½	Nom.	.03¾	.09¾	.03½	.05
Poppyseed, bbls NY....gal.	1.45	1.60	1.45	1.70	1.60	1.75
Rapeseed, lawn, bbls NY...gal.	.08	.082	....	....	.....	.....
denatured, drms, NY....gal.	.42	.44	.34	.65	.....	.....
Red, Distilled, bbls....lb.	.07	.07⅜	.05⅞	.07⅜	.06⅛	.07
Tanks....lb.	.....	.06	.05	.06	.05¼	.06
Salmon, Coast, 8000 gal tks. gal.	.17	Nom.	.11	.18	.11	.19
Sardine, Pacific Coast tks...gal.	.16	Nom.	.09½	.20	.09½	.17½
Sesame, edible, yellow, dos...lb.	.08½	.09	.08½	.10	.08½	.09½
White, dos....lb.	.09	.09½	.10	.11	.10	.11
Sod, bbls NY....gal.	.....	.40	....	.40	.....	.40
Soy Bean, crude....						
Pacific Coast....lb.	.....	Nom.	.032	.035	.02¾	.03½
Domestic tanks, f.o.b. mills, lb.	.....	.065	.027	.085	.03	.032
Crude, bbls NY....lb.	.071	.075	.04	.095	.03¾	.05
Refined, bbls NY....lb.	.076	.088	.04½	.106	.04½	.06
Sperm, 38° CT, bleached, bbls NY....lb.	.108	.11	....	....	.....	.....
45° CT, bleached, bbls NY..lb.	.101	.103	....	....	.....	.....
Stearic Acid, double pressed dist bags....lb.	.09½	.10	.07½	.10	.07½	.09
Double pressed saponified bags ....lb.	.09½	.10	.08	.10	.07	.08½
Triple, pressed dist bags..lb.	.12¼	.12¾	.10¼	.12¾	.10¼	.11
Stearine, Oleo, bbls....lb.	.05⅛	.05¼	.03½	.06¾	.03¾	.06
Tallow City, extra loose....lb.	.03¼	.03½	.02	.03⅞	.02½	.03⅜
Edible, tierces....lb.	.04¼	.04½	.03½	.05⅛	.03⅜	.04½
Tallow Oil, Bbls, c-1 NY...lb.	.05¾	.06	.05¾	.06	.05¾	.07½
Acidless, tanks NY....lb.	.....	.06¾	.05	.07¼	.06	.09
Vegetable, Coast mats....lb.	.05⅛	Nom.	.04½	.06	.06	Nom.
Turkey Red, single, bbls....lb.	.07½	....	.06¼	.07½	.06½	.09
Double, bbls....lb.	.12½	.13	.08	.13	.08	.11
Whale,....						
Winter bleached, bbls, NY..lb.	.....	.072	....	....	.....	.....
Refined natural, bbls, NY..lb.	.068	.07	....	....	.....	.....

THE CHEMICAL MARKET-PLACE

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Index to Advertisers

Index to Advertisers

"We"—Editorially Speaking

Our Washington gossipmonger whispers that du Pont has had three star salesmen at the Treasury Department, trying to sell Duprene as the raw material for the next U. S. paper currency.

The quotation in our leading editorial is from "The Romance of Research" by L. V. Redman and A. V. H. Mory—a companion volume to Dr. Hale's "Chemistry Triumphant"—and just as well worth a careful reading.

The *Hercules Mixer* is becoming very disconcerting. Having complimented its sprightly editor upon a very perfect burlesque of *Time* last month, she scores again by sending us an equally perfect imitation of a newsprint wild west thriller. We dare her to parody CHEMICAL INDUSTRIES.

Our Biblical quotation about the NRA has a supplement—look up the Book of Ezekiel, Seventeenth Chapter—it's too long to reprint, but it's all full of prophesy about the Blue Eagle. At least, so E. A. Brandis, of the Standard Chemical Company, told Charlie Brand, of the National Fertilizer Association.

Every month it seems we publish something that fills our mail-basket with correspondence. Some controversial article, a bouquet or brick-bat on this page, an expression of editorial opinion and—alas—sometimes a mistake. This month it was the editorial message to President Roosevelt. With one shining exception the comments have been highly commendatory—the objector to our opinion argued eloquently against "rocking the boat". The following are some particularly striking samples:

"I'd love to go buzzard hunting with you."

"It's jolly well time somebody told King Canute where he gets off in forbidding the rise and fall of natural tides."

"I should like to ask the President where he expects to find the provident, cautious and saving public if he (a) tries to make them waste by threats of insecurity, (b) robs them of what they have saved by inflation, (c) taxes them poor to coddle and pamper the improvident and finally undertakes to set a fiat limit to their hours of labor."

"May I congratulate you on the agressiveness of the opening page of your November issue. If we can have some more fearless criticism like that in your editorial pages, perhaps we will find a nucleus around which to form our ranks."

"I wish the conservative advisers, who actually had payrolls to meet, would break through the President's bodyguard of professors, women and army officers."

Chlorinated rubber is controversial, and we publish, in this issue, an abstract of a lecture before the Paint Research Station at Teddington, England, by Dr. Krumbhaas, who is Director of the *Institut fur Lackforschung*, Berlin.

An enthusiastic subscriber has written us in this vein: "CHEMICAL INDUSTRIES gets attention even when press of work forces other journals to languish unnoticed on my desk."

Fifteen Years Ago

From our issues of December, 1918

The Grasselli Company announces purchase of the chemical division of the Bayer Company for $2,500,000.

The Barrett Company declares an extra dividend of $1 per share on common stock, putting the company on an eight per cent. dividend basis for 1918.

Hercules Powder Company decides to abandon California potash plant erected at a cost of $6,000,000.

Du Ponts solve dye problems by erecting huge dye plant at Deepwater, N. J., to make vat dyes for cotton goods, along with other colors—crudes and intermediates also available.

The Powers-Weightman-Rosengarten Company, Philadelphia, acquires building at 837 North Tenth Street for manufacture of chemicals, etc.

Secretary of the Treasury announces the discovery of a process for producing glycerin synthetically by fermentation of sugar.

It's a pity that we cannot serve up Dr. Landis' paper on inflation with all the trimmings. When he originally delivered this to Cyanamid's employees, he had a rubber measuring tape, a rod—easily and accurately divided into two parts, and a collection of coins and paper money, which he used effectively as "props." Fortunately for you, what he says is so alive and touches your own interests so closely that you won't need any assistance in reading it.

Printers' Ink suggests "When a competitor follows you, advertise him!"—what interesting possibilities that has in a good old-fashioned chemical price war.

We have always thought that Uncle Sam, who requires bills in triplicate and an affidavit as to the cost, was the most exacting subscriber we had, but we have just received an order from the Asiatic Petroleum Company requesting invoices in ten-fold which seems to be just about the ultimate in bookkeeping systems.

Is there a more hazardous occupation today than playing the prophet? We doubt it, and we don't want to stick our necks unnecessarily above the parapet, but we just can't refrain from a little horn-tooting.

In our April issue we said—"We have gone off gold and initiated inflation.

From our June issue—"The chemical industries are fortunate in having ready to hand a common organization, the Chemical Alliance. Its charter has never been surrendered, and its organization into Committees could be quite simply changed to represent existing organizations representing heavy chemicals, coal-tar synthetics, alkalies, alcohol, etc."

From the same issue—"There has been surprisingly little criticism and virtually no concerted opposition (the President's policies). This astonishing success ought not to delude his devoted retainers into the belief that the king can do no wrong. Nothing would so quickly raise antagonism as a return of the old Wilsonian tyranny, that branded as treachery any honest opinion, and outlawed as a menace to society any opponent."

In October—"The question of enforcement looms bigger as more permanent codes are approved and, as we pointed out three months ago, will prove the crucial test of NRA."